

Title 296 WAC

LABOR AND INDUSTRIES, DEPARTMENT OF

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Chapter 296-04 WAC

INTERNAL RULES—STATE APPRENTICESHIP AND TRAINING COUNCIL

WAC

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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-04-320 Definitions. [Order 71-13, § 296-04-320, filed 10/28/71.]
Repealed by 95-07-117, filed 3/21/95, effective 4/21/95.
Statutory Authority: RCW 49.04.010.

WAC 296-04-001 Foreword. The Washington State Apprenticeship and Training Act, RCW 49.04.010 - 49.04.910, establishes the council and its administrative arm, the apprenticeship and training division of the department of labor and industries. The intention of the council and department in promulgating and adopting these rules is to establish a uniform procedure to be followed by state and local apprenticeship and training committees in presenting matters to the state apprenticeship and training council and further to establish standards by which the council can operate to effectuate its statutory obligations set forth in the apprenticeship act.

The Washington state apprenticeship and training council recognizes the importance of quality apprenticeship programs to meet the growing needs of employers and employees for high quality training. The council also recognizes that rapid changes in our state's economy and technological change necessitates skilled workers who meet industry-wide standards in order to compete successfully in the changing marketplace. Employers will benefit by knowing that skilled workers who have graduated from a state recognized apprenticeship program have been trained to industry-wide standards and not exclusively in response to the needs of an individual employer or group of employers.

The council also recognizes that the delivery and regulation of apprenticeship programs should be conducted in a manner which avoids needless duplication on the part of the department of labor and industries, community colleges, and vocational-technical institutes. It is important that approved apprenticeship programs be structured to maximize the protection of the apprentice by providing a meaningful process which allows the apprentice to ensure that his or her rights as an apprentice are protected throughout the term of the apprenticeship.

The council further recognizes that the number of apprentices in a trade or group of trades in any geographic area must be sufficient to meet the needs of all employers and not be so large as to create an oversupply of apprentices. Because quality apprenticeship training requires reasonably continuous on-the-job training, an oversupply of apprentices

in any geographic area is to be avoided, if possible, in an effort to maintain ongoing quality training.

The council further recognizes that the attainment of quality apprenticeship training and the planning of numbers of new apprentices in a trade or group of trades will be accomplished best by the establishment of one joint apprenticeship and training committee serving the entire trade or group of trades in a specified geographic area. A single committee is best able to train to industry-wide standards which will enable workers to move between firms when economic necessity requires. A single committee is best able to determine the number of apprentices needed in an entire trade or group of trades in a specified geographic area.

The council also recognizes the benefit apprentices gain in having the widest range of employers and their apprentices represented in the related and supplemental training classes. The intermingling of apprentices representing the widest array of firms possible, in related and supplemental training classes, exposes apprentices to the widest possible range of work experiences. This sharing of work experiences increases the quality of training, benefiting both apprentices and employers.

The council intends that apprenticeship programs be available to meet the training needs of all employers in the state of Washington. These programs are open to all employers on an equal and nondiscriminatory basis. The need for continued quality training, equal treatment of apprentices, and efficient delivery of training suggest that these training needs are best met through existing programs.

As provided in WAC 296-04-160, committees approved by the council shall offer training opportunities on an equal basis to all employers. Existing committees are expected to provide apprenticeship and training opportunities for employers not currently participating in the program:

(1) At a reasonable cost that is equivalent to the cost incurred by employers and apprentices currently participating;

(2) With equal treatment and opportunity for all apprentices; and

(3) With reasonable working and training conditions that apply to all apprentices uniformly and equally;

(4) An employer shall not be required to sign a collective bargaining agreement in order to participate in an apprenticeship program.

(5) All employers requesting "approved training agent" status shall sign an agreement agreeing to comply with all federal or state apprenticeship rules and the appropriate apprenticeship standards. When the sponsor approves the "approved training agent" agreement, he/she shall furnish the department with a copy and shall notify the department when any agreement is rescinded.

All policies and rules of the council are designed to strengthen apprenticeship and training in the state of Washington, as well as to explain related factors established under existing state and federal laws. The council, as the responsible legislative organ governing apprenticeship and training, requests the cooperation and assistance of all interested persons, organizations, and agencies functioning within the framework of the rules and regulations.

[Statutory Authority: RCW 49.04.010. 95-07-117, § 296-04-001, filed 3/21/95, effective 4/21/95. Statutory Authority: RCW 49.04.010 and 49.04.040. 90-21-118, § 296-04-001, filed 10/22/90, effective 11/22/90;

Order 71-3, § 296-04-001, filed 3/25/71; Foreword, filed 10/11/65, filed 2/12/65, filed 3/23/60.]

WAC 296-04-005 Apprenticeship and training agreements—Proposed standards. The Washington state apprenticeship and training council is the body responsible for matters concerning apprenticeship and training in the state of Washington. The principal function of the council is to approve and register apprenticeship and training agreements. Persons or organizations desiring to institute an apprenticeship or training program must first create a committee and submit affidavits to the Washington state apprenticeship and training council requesting that the council recognize the committee. The committee must then prepare proposed standards which conform to these rules and to RCW 49.04.050. The standards must also include the composition of and general rules for the committee which will administer the program. The supervisor, or Washington state apprenticeship coordinators, are available to give assistance in this task.

These standards, which will be either a plant program or committee program as defined herein, must then be presented to the supervisor at least 45 days before the regular meeting at which the council will be requested to consider such proposed standards. The standards proposed will then be discussed by the council and approved, disapproved, or approved subject to enumerated changes. The council, at its meetings, will allow changes made for clerical errors and additions of standard approved language deleted from the proposed standard if authorized representatives of all concerned are present and authorized to accept changes. The council will not accept changes at its meetings in the format or language not deemed standard by the council.

The committee thus set up then begins functioning. Its duties are to run the day to day operations of the apprenticeship and training program. It is charged with operating the program in accordance with the standards as approved by the council. It is charged with accepting or rejecting applicants for apprenticeship or training, registering accepted applicants as apprentices or trainees with the supervisor of apprenticeship and training, removing apprentices or trainees from the program in accordance with the standards and informing the supervisor of any matters which affect the standing of individuals as apprentices or trainees. Persons not registered with the supervisor as apprentices or trainees cannot be recognized as apprentices or trainees by the council.

The supervisor and his staff may be consulted on any matters concerning apprenticeship and training, and they will provide any information concerning apprenticeship training which is available to them. They are also required to investigate any discrepancies between the actual and required operation of any program and conduct systematic reviews of the operation of all programs. The supervisor may recommend cancellation of any program which is not operated in accordance with its approved standards after notice of violation is given in accordance with the provisions of WAC 296-04-270(3).

The supervisor and the council will act to assist in the resolution of any complaints against local committees, or other organizations administering apprenticeship agreements, by any apprentices who have completed their probationary period, as provided in WAC 296-04-295.

[Statutory Authority: RCW 49.04.010, 95-07-117, § 296-04-005, filed 3/21/95, effective 4/21/95. Statutory Authority: Chapter 49.04 RCW, 85-22-035 (Order 85-31), § 296-04-005, filed 11/1/85. Statutory Authority: RCW 49.04.010, 80-03-004 (Order 80-2), § 296-04-005, filed 2/8/80; Order 71-3, § 296-04-005, filed 3/25/71.]

WAC 296-04-015 Definitions. Whenever in these rules and regulations, the following words shall have these meanings:

(1) "Council" shall mean the Washington state apprenticeship and training council established pursuant to RCW 49.04.010.

(2) The words "apprenticeship committee" shall mean a state or local joint apprenticeship committee established pursuant to RCW 49.04.040.

(3) The words "regular meeting" shall mean a public meeting of the council as described in WAC 296-04-040(1).

(4) The term "special meeting" shall mean a public meeting of the council as described in WAC 296-04-040(2).

(5) The word "supervisor" shall mean the supervisor of apprenticeship and training appointed pursuant to RCW 49.04.030.

(6) The term "agreement" shall mean an apprenticeship agreement and/or training agreement.

(7) The term "plant program" is defined in WAC 296-04-050.

(8) The term "individual agreement" shall mean a written agreement between an apprentice and/or trainee and either his employer or an apprenticeship committee acting as agent for the employer.

(9) The term "committee program" shall mean an apprenticeship agreement described in WAC 296-04-270 (1)(a) through (k).

(10) The term "on-the-job training program" shall mean a program described in WAC 296-04-280.

(11) The term "trainee" shall mean a person registered with the supervisor pursuant to WAC 296-04-270 or 296-04-280.

(12) The term "apprentice" shall mean a person registered with the supervisor pursuant to an apprenticeship training program pursuant to WAC 296-04-270 for purposes of chapter 49.04 RCW and these rules.

(13) The term "standards" shall mean a written agreement setting forth a plan containing all terms and conditions for the qualifications, recruitment, selection, employment, and training of apprentices, as further defined in RCW 49.04.050.

(14) The term "registration" shall mean the maintenance of records of apprenticeship and training agreements and of apprenticeship and training standards.

(15) The term "sponsor" shall mean any firm, association, committee, or organization operating an apprenticeship and training program through an employer and employee relationship and in whose name the program is registered or is to be registered.

(16) The term "department" shall mean the department of labor and industries.

(17) The term "related/supplemental instruction" shall mean that instruction that is approved by the program sponsor. It shall be taught by a trade competent instructor who shall have demonstrated said competency by satisfactory employment performance in the occupation for a period of

a minimum of three years beyond the customary learning period for this occupation. Instructors shall be approved by the sponsor. The sponsor shall review said instruction annually for relevancy and currentness. Relevancy shall mean instructional content that is directly required in and applicable to the performance of the work. Relevancy shall not mean academic course content taught by a solely academically qualified instructor except for courses approved by the committee or specified by state law. Currentness means that the instructional content is and remains consistent with the latest trade practices, improvements, and technical advances.

[Statutory Authority: RCW 49.04.010, 95-07-117, § 296-04-015, filed 3/21/95, effective 4/21/95. Statutory Authority: 1982 1st ex.s. c 39 §§ 1, 3, 82-22-042 (Order 82-30), § 296-04-015, filed 10/29/82. Statutory Authority: RCW 49.04.010, 80-03-004 (Order 80-2), § 296-04-015, filed 2/8/80; Order 76-4, § 296-04-015, filed 2/20/76; Order 71-13, § 296-04-015, filed 10/28/71; Order 71-3, § 296-04-015, filed 3/25/71; § I, filed 10/11/65; § I, filed 2/12/65.]

WAC 296-04-160 Apprenticeship committees. (1) Apprenticeship committees shall be appointed in accordance with the provisions of RCW 49.04.040. Such committees shall have the duties prescribed by statute, these rules and the approved standards under which they operate. Committees shall function, administrate or relinquish authority only with the consent of the council. On any petition addressed to the council or the supervisor, only the signature of the elected chairman and secretary of the committee shall be accepted unless the apprenticeship committee has petitioned the council to recognize and accept the signature of another person. Such a petition must be signed by a quorum of the members of the petitioning apprenticeship committee.

(2) Committees approved by the council shall offer training opportunities on an equal basis to all employers and apprentices including all rights, appeals, and services available in the existing apprenticeship program. If an existing committee refuses to provide access to apprenticeship and training opportunities to all employers, the council shall take action as necessary to remove all restrictions to access. Council action may include, but is not limited to, the decertification of the existing committee and recognition of a new committee in order to carry out the intent of chapter 49.04 RCW and the rules adopted under its authority.

(3) Apprenticeship committees shall be composed of no less than four members nor shall the committee be composed of more than twelve members. Exceptions may be granted by the council.

(4) It is the council's view that joint apprenticeship and training committees are not state agencies but rather only quasi-public entities performing services jointly for management and labor by assistance to the apprenticeship program.

[Statutory Authority: RCW 49.04.010, 95-07-117, § 296-04-160, filed 3/21/95, effective 4/21/95. Statutory Authority: RCW 49.04.010 and 49.04.040, 90-21-118, § 296-04-160, filed 10/22/90, effective 11/22/90. Statutory Authority: RCW 49.04.010, 78-12-022 (Order 78-21), § 296-04-160, filed 11/14/78; Order 76-4, § 296-04-160, filed 2/20/76; Order 72-8, § 296-04-160, filed 6/8/72; Order 71-3, § 296-04-160, filed 3/25/71; § XVI, filed 10/11/65; § XVI, filed 2/12/65; § X A, filed 3/23/60.]

WAC 296-04-165 Union waiver. Under a program proposed for registration by an employer or employers' association, and where the standards, collective bargaining

agreement or other instrument, provides for participation by a union in any manner in the operation of the substantive matters of the apprenticeship program, and such participation is exercised, written acknowledgement of union agreement or "no objection" to the registration is required. Where no such participation is evidenced and practiced, the employer or employers' association shall simultaneously furnish to the union, if any, which is the collective bargaining agent of the employees to be trained, a copy of its application for registration and of the apprenticeship program. The registration agency shall provide a reasonable time period of not less than 30 days nor more than 60 days for receipt of union comments, if any, before final action on the application for registration and/or approval.

[Statutory Authority: RCW 49.04.010, 95-07-117, § 296-04-165, filed 3/21/95, effective 4/21/95; 78-12-022 (Order 78-21), § 296-04-165, filed 11/14/78.]

WAC 296-04-270 Apprenticeship agreements—Types—Standards—Registration, review, cancellation, reregistration—Certificate of completion. (1) The following apprenticeship agreements shall be recognized pursuant to RCW 49.04.060:

(a) A written agreement between an association of employers and an organization of employees describing the conditions of training for apprentices.

(b) A written statement of an employer or a written agreement between an employer and an employee organization describing the conditions of training apprentices. The former agreement shall be recognized only if there is no bona fide employee organization in the plant affected by the agreement.

(c) A written agreement between an employer and an individual apprentice describing the conditions of apprenticeship.

(d) Group-joint, or area joint program where there is a labor organization. A program jointly sponsored by a group of employers and a labor organization administered by a joint apprenticeship and training committee (JATC) equally composed from management and labor.

(e) Individual-joint, a program where there is a labor organization. A program jointly sponsored by an individual employer and a labor organization administered by a joint apprenticeship and training committee (JATC) composed equally from management and labor.

(f) Group nonjoint, or area group program where there is no labor organization. A program sponsored by a group of employers administered by an apprenticeship committee.

(g) Individual nonjoint, a program where there is no labor organization. A program sponsored and administered by an individual employer not jointly sponsored with a labor organization.

(h) Group waiver, a program with more than one firm (a group of employers) where either the employer group or the labor organization has voluntarily waived participation and has so notified the other party in writing.

(i) Individual waiver, a program involving an individual person, company, plant, firm, and a labor organization where management or labor has voluntarily waived participation and has so notified the other party in writing.

(j) Nonjoint and waived committees shall be composed of representatives of which fifty percent shall by reason of education and experience be occupationally qualified in the specific occupation specified in the standards for which the committee is responsible.

(k) The council shall only recognize nonjoint and waived standards for a specific occupation or directly related occupations. When multiple related occupations are approved on a single standard, each occupation shall be considered as an individual standard. Unrelated occupations shall be submitted under separate standards.

(2) Apprenticeship agreements shall conform to the following standards:

(a) Committee programs, plant programs, and on-the-job training programs must contain the provisions required by RCW 49.04.050 and, in addition, shall contain:

(i) Provision for nondiscrimination in the selection of apprentices in substantially the following form:

Each sponsor of an apprenticeship program shall include in its standards the following equal opportunity pledge: "The recruitment, selection, employment and training of apprentices during their apprenticeship shall be without discrimination because of race, color, religion, national origin, or sex. The sponsor will take affirmative action to provide equal opportunity in apprenticeship and will operate the apprenticeship program as required by the rules of the Washington state apprenticeship and training council and Title 29, Part 30 of the Code of Federal Regulations."

(ii) Provision that there shall be no discrimination on the basis of race, color, creed, sex, or national origin after selection during all phases of employment during apprenticeship.

(iii) Provision that adequate records of the selection process must be kept for a period of at least five years and will be made available to the council or its designated representative on request. Such records must include a brief summary of any interviews and the conclusions reached on each of the specific factors which are part of the total judgment concerning each applicant.

(iv) Provision for local committee rules and regulations consistent with these rules and the applicable apprenticeship agreement.

(b) Any proposed standards for apprenticeship must be consistent with any standards for apprenticeship already approved by the council for the industry, craft or trade in question to the end that there is general statewide uniformity of such standards in each industry, trade or craft. Proposed standards shall be considered consistent if they are equal to or exceed the average number of hours and do not exceed the maximum number of hours for such trade, craft, or occupation within this state. In addition, the course content and delivery method are similar to the extent that they are designed to achieve the same levels of skills as existing standards within the state for that industry, trade, or craft.

(c) Shall contain a statement of the progressively increasing scale of wages based on specified percentages of a specific wage which shall be submitted to the council and updated no less than annually.

(d) A sample apprenticeship agreement which the council approves is available on request from the supervisor.

(3) Registration, review, cancellation, reregistration.

(a) All individual agreements shall be registered with the supervisor and subject to his approval.

(b) The supervisor and his staff, in the performance of their field work, shall conduct a systematic review of all plant and committee programs and shall take appropriate action, including recommendation of cancellation, when they find that any program is not being operated according to these rules and regulations or according to its applicable standards.

(c) When any program is found to be operating in a manner inconsistent with or contrary to these rules and regulations or its established plant or committee program, the supervisor shall notify the offending committee, person, firm or agency of the violation. If the supervisor does not receive notice, within 60 days, of action taken to correct such violations, the supervisor may take whatever action he deems necessary, including recommendation of cancellation of the apprenticeship or training program and agreement to the council.

(d) If the supervisor deems it necessary to recommend cancellation of an apprenticeship or training program, he shall do so in writing to each council member, stating in detail the reasons for his recommendation. A copy of said recommendation shall be mailed to the last known address of each member of the committee administering said program, or to those persons responsible for said program, together with notice that the council shall consider the recommendation at its next regularly scheduled meeting more than 30 days subsequent to the date of the recommendation and that all interested persons may present evidence or testimony regarding said recommendation. The council shall decide the question before it upon majority vote of the members present and voting and shall notify all interested parties of its decision, together with the reasons for it, in writing.

(e) The cancellation of any program or agreement shall automatically effect a cancellation of any agreement registered thereunder, provided that any organization or firm not responsible for the violations causing the cancellation may petition the council for approval of such cancelled agreement or program as a new program.

(f) Certificates of completion shall be issued at the request of the appropriate committee. An affidavit of the secretary, chair, or authorized official of the committee concerned shall accompany the request, which affidavit shall state that the apprentice has successfully completed the apprenticeship program of that committee, and that he/she has been an active, registered participant of that committee's program for at least six months.

[Statutory Authority: RCW 49.04.010, 95-07-117, § 296-04-270, filed 3/21/95, effective 4/21/95; 93-04-100, § 296-04-270, filed 2/2/93, effective 3/5/93. Statutory Authority: RCW 49.04.010 and 49.04.050, 90-10-020, § 296-04-270, filed 4/23/90, effective 5/24/90. Statutory Authority: RCW 49.04.050, 87-01-046 (Order 86-43), § 296-04-270, filed 12/15/86. Statutory Authority: RCW 49.04.010, 80-03-004 (Order 80-2), § 296-04-270, filed 2/8/80; Order 76-4, § 296-04-270, filed 2/20/76; Order 71-3, § 296-04-270, filed 3/25/71; § XXVI, filed 10/11/65; § XXVI, filed 2/12/65.]

WAC 296-04-320 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-04-440 Adoption of consistent state plans. All apprenticeship programs registered with the council shall comply with the requirements of WAC 296-04-300 through 296-04-480 within 90 days after the effective date of these rules.

(1) The United States Department of Labor shall have authority to conduct compliance reviews to determine whether the Washington state affirmative action plan or any state apprenticeship program registered with the council is being administered or operated in accordance with the provisions of Title 29, Part 30 of the Code of Federal Regulations.

(2) It shall be the responsibility of the council to take the necessary action to bring a noncomplying program into compliance with these rules. In the event the council fails to fulfill this responsibility, the secretary of the United States Department of Labor may withdraw the recognition for federal purposes of any or all state apprenticeship programs, in accordance with the procedures for deregistration of programs registered by the department, or refer the matter to the attorney general of the United States with a recommendation for the institution by the attorney general of a court action under Title 7 of the Civil Rights Act of 1964.

(3) The council shall notify the United States Department of Labor of any state apprenticeship program disapproved and deregistered by it.

(4) Any state apprenticeship program disapproved and deregistered by the council for noncompliance with the requirements of these rules or Title 29, Part 30 of the Code of Federal Regulations may, within 15 days of the receipt of the notice of disapproval and deregistration, appeal to the United States Department of Labor to set aside the determination of the state apprenticeship and training council. The United States Department of Labor shall make its determination on the basis of the record. The United States Department of Labor may grant the state program sponsor, the state apprenticeship and training council, and the complainant, if any, the opportunity to present oral or written argument.

(5) **Withdrawal of recognition.** Whenever the United States Department of Labor determines that reasonable cause exists to believe that the council has not adopted or implemented a plan in accordance with the equal opportunity requirements of Title 29, Part 30 of the Code of Federal Regulations, it shall give notice to the council and to appropriate state sponsors of this determination, stating specifically wherein the state's plan failed to meet such requirements and the United States Department of Labor proposes to withdraw recognition for federal purposes from the state apprenticeship and training council unless within 15 days of the receipt of the notice, the council complies with the provisions of Title 29, Part 30, of the Code of Federal Regulations or mails a request for a hearing to the secretary of the United States Department of Labor.

(6) If within 15 days of the receipt of the notice provided for in subsection (5) of this section, the council neither complies with the provisions of Title 29, Part 30 of the Code of Federal Regulations, nor mails a request for a hearing, the secretary of the United States Department of Labor shall notify the council of the withdrawal of recognition.

(7) If within 15 days of the receipt of the notice provided for in subsection (5) of this section, the council mails a request for a hearing, the secretary of the United States Department of Labor shall proceed in accordance with Title 29, Section 30.16 of the Code of Federal Regulations.

(8) If a hearing is conducted in accordance with Title 29, Section 30.16 of the Code of Federal Regulations, the secretary of the United States Department of Labor upon receipt of the proposed findings and recommended decision of the hearing officer shall make a final decision whether the council has adopted or implemented a plan in accordance with equal opportunity requirements of Title 29 of Part 30 of the Code of Federal Regulations.

(9) If the secretary of the United States Department of Labor determines to withdraw from recognition, for federal purposes, from the state apprenticeship and training council, the secretary shall notify the council of this determination. The secretary shall also notify the state's sponsors that within 30 days of the receipt of the notice the United States Department of Labor shall cease to recognize, for federal purposes, each state apprenticeship program unless the state program sponsor requests registration with the United States Department of Labor. Such registration may be granted contingent upon finding that the state apprenticeship and training program is operating in accordance with the requirements of Title 29, Part 30 of the Code of Federal Regulations.

(10) If the secretary of the United States Department of Labor determines to withdraw recognition, for federal purposes, from the state apprenticeship [and training council], such recognition may be reinstated upon presentation of adequate evidence to the secretary of the United States Department of Labor that the council has adopted and implemented a plan carrying out the equal opportunity requirements of Title 29, Part 30 of the Code of Federal Regulations.

[Statutory Authority: RCW 49.04.010, 95-07-117, § 296-04-440, filed 3/21/95, effective 4/21/95; 78-12-021 (Order 78-20), § 296-04-440, filed 11/14/78; Order 71-13, § 296-04-440, filed 10/28/71.]

Reviser's note: RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

Chapter 296-17 WAC

MANUAL OF RULES, CLASSIFICATIONS, RATES, AND RATING SYSTEM FOR WASHINGTON WORKERS' COMPENSATION INSURANCE

WAC

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WAC 296-17-320 General definitions. For the purpose of interpretation of this manual, chapter 296-17 WAC, or administering Title 51 RCW, the following terms shall have the meanings given below:

(1) "Workers' compensation" means the obligation imposed upon an employer by the industrial insurance laws of the state of Washington, to insure the payment of benefits prescribed by such laws.

(2) "Risk" means and includes all insured operations of one employer within the state of Washington.

(3) "Classification" means a grouping of businesses or industries having common or similar exposures without regard to the separate employments, occupations, or operations normal to the business or industry.

(4) "Basic classification" shall be understood to have the same meaning as classification defined in subsection (3) of this section.

(5) "Exposure" means worker hours, worker days, payroll or other measure of the extent to which an employer's workers have been exposed to the hazards found within a particular business or industry classification.

(6) "Rate" means the amount of premium for each unit of exposure. All rates are rates per worker hour except where specifically provided otherwise in this manual.

(7) "Premium" means the sum derived from the application of the rates to the exposures in each classification, after application of any duly authorized experience modification, except where the rules of this manual indicate otherwise.

(8) Unless the context indicates otherwise, the words used in this manual shall have the meanings given in Title 51 RCW.

(9) "Free from control or direction" shall mean that the contracted individual has the responsibility to deliver a finished product or service without the contracting firm or individual either exercising direct supervision over the work hours or the methods and details of performance or having the right to exercise that authority under the contract.

(10) "Principle place of business" shall be the physical location of the business from which the contract of service is directed and controlled.

(11) "Within a reasonable period" for establishing an account with state agencies shall be the time prior to the first date on which the individual begins performance of service toward the contract or the date upon which the individual is required to establish an account with a state agency, as otherwise required by law, whichever event shall last occur.

(12) "Bona fide officer" means any person empowered in good faith by stockholders or directors, in accordance with articles of incorporation or bylaws, to discharge the duties of such officer.

(13) "Related by blood within the third degree" means the degree of kinship as computed according to the rules of the civil law.

(14) "Related by marriage" means the union subject to legal recognition under the domestic relations laws of this state.

(15) "Actual hours worked" means each worker's composite work period, including all of the time work was performed by the employee, as well as all periods of mandatory presence at the work site, during each work day, excluding lunch period. See also RCW 51.08.013.

(16) "Work day" shall mean any consecutive twenty-four-hour period.

[Statutory Authority: RCW 51.04.020, 95-08-052, § 296-17-320, filed 4/3/95, effective 7/1/95. Statutory Authority: RCW 51.04.120, 91-24-057, § 296-17-320, filed 11/29/91, effective 1/1/92. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 91-12-014, § 296-17-320, filed 5/31/91, effective 7/1/91. Statutory Authority: RCW 51.16.035, 86-12-041 (Order 86-18), § 296-17-320, filed 5/30/86, effective 7/1/86; 85-06-026 (Order 85-7), § 296-17-320, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-320, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-320, filed 11/9/73, effective 1/1/74.]

WAC 296-17-350 Assumed worker hours. Unless otherwise stated within the general reporting rules, classification definitions, or rate tables, the basis of premium to be used for reporting and paying workers' compensation insurance premiums is actual hours worked. Assumed number of worker hours must be, and hereby, is established:

(1) **Excluded employments.** Any employer having any person in their employ excluded from industrial insurance whose application for coverage under the elective adoption provisions of RCW 51.12.110 or authority of RCW 51.12.095 or 51.32.030 has been accepted by the director shall report and pay premium on the actual hours worked for each such person who is paid on an hourly, salaried-part time, percentage of profit or piece basis; or one hundred sixty hours per month for any such person paid on a salary basis employed full time. In the event records disclosing actual hours worked are not maintained by the employer for any person paid on an hourly, salaried-part time, percentage of profits or piece basis the worker hours of such person shall be determined by dividing the gross wages of such person by the state minimum wage for the purpose of premium calculation. However, when applying the state minimum wage the maximum number of hours assessed for a month will be one hundred sixty.

(2) **Building or property management.** Resident managers, caretakers, or similar employments that are employed for irregular periods and whose compensation is for a stipulated sum in money or a substitute for money shall be reported for the purpose of premium calculation by dividing total compensation by the average hourly wage for classification 4910 as contained in WAC 296-17-89501 "average hourly wages" to determine reportable assumed hours. Provided that the reportable exposure calculated under this subsection shall not exceed 520 hours per quarter for each worker.

(3)(a) **Commission personnel—Inside employments.** Commission personnel—inside employments are persons whose compensation is based upon a percentage of the amount charged for the commodity or service rendered and

who are employed exclusively within an office having no duties away from the office. Commission personnel—inside employments are to be reported for premium purposes at a minimum of assumed worker hours of not less than eight worker hours a day for part-time employment, or not less than 40 worker hours per week for full-time employment unless the employer maintains and presents to the department's representative at the time of audit payroll records that show in detail the name of each such commissioned worker, the actual number of hours worked for each such worker and the date or dates the services were rendered. If actual time records are maintained then such actual hours shall be reported to the department and premiums paid on such actual hours.

(b) **Commission personnel—Outside employments.** Commission personnel—outside employments are persons whose compensation is based upon a percentage of the amount charged for the commodity or service rendered and who are employed to perform duties primarily away from the employers premises although some office work may be performed. Commission personnel—outside employments are to be reported for premium purposes at a minimum of assumed worker hours of not less than eight worker hours a day for part-time employment, or not less than 40 worker hours per week for full-time employment: *Provided*, That the assumed eight worker hours daily for part-time employment will apply only if the employer's books and records are maintained so as to show separately such person's actual record of employment.

(4) **Salaried personnel.** Salaried personnel for the purposes of this chapter means persons whose compensation is not governed by the number of hours devoted to employment for their employer. Employers having salaried personnel in their employ shall for the purpose of premium calculation report assumed worker hours based upon one hundred sixty worker hours for each month in which the employee is on salary: *Provided*, That if the employer maintains complete and accurate records, supported by original time cards or timebook entries, the employer may report and pay premium on the actual hours worked by salaried personnel: *Provided further*, That the department may, at its discretion, authorize some other method in assuming workers hours for premium calculating purposes in the case of contract personnel employed by schools and/or school districts.

(5) **Noncontact sports teams.** All employers having personnel in their employ as defined under WAC 296-17-745 shall for the purpose of premium calculations, report assumed worker hours based upon 40 worker hours for each week in which any duties are performed.

(6) **Jockeys and race drivers.** All employers having personnel in their employ as defined under WAC 296-17-739 shall, for the purpose of premium calculations, report assumed worker hours based upon ten hours for each mount in each horse race; professional drivers shall report worker hours based upon ten hours for each heat or race of any racing event: *Provided*, That any day such personnel do not ride or drive in a race, the premium calculation shall be made by assuming ten worker hours for any day in which duties are performed.

(7) **Pilots and flight crew members.** Pilots and flight crew members having flight duties during a work shift including preflight time shall have premium calculated by utilizing daily readings logged per federal requirements of the aircraft tachometer time: *Provided*, That if the total tachometer time for any day includes a fraction of an hour, the reportable time will be increased to the next full hour: *Provided further*, That pilots and flight crew members who assume nonflying duties during a work shift will have premium calculated in accordance with the appropriate rules and classifications applicable to nonflight duties.

[Statutory Authority: RCW 51.04.020. 95-08-052, § 296-17-350, filed 4/3/95, effective 7/1/95. Statutory Authority: RCW 51.04.020(1). 94-12-050, § 296-17-350, filed 5/27/94, effective 7/1/94. Statutory Authority: RCW 51.04.020(1) and 54.16.035. 93-12-093, § 296-17-350, filed 5/31/93, effective 7/1/93; 90-13-018, § 296-17-350, filed 6/8/90, effective 7/9/90; 89-24-051 (Order 89-22), § 296-17-350, filed 12/1/89, effective 1/1/90. Statutory Authority: RCW 51.04.020(1). 89-16-001 (Order 89-07), § 296-17-350, filed 7/20/89, effective 8/20/89. Statutory Authority: RCW 51.16.035 and 51.04.020. 89-07-078 (Order 89-02), § 296-17-350, filed 3/21/89, effective 4/21/89. Statutory Authority: RCW 51.16.035. 88-14-076 (Order 87-31), § 296-17-350, filed 7/1/88, effective 1/1/89; 88-12-065 (Order 88-05), § 296-17-350, filed 5/31/88; 87-24-060 (Order 87-26), § 296-17-350, filed 12/1/87, effective 1/1/88; 85-06-026 (Order 85-7), § 296-17-350, filed 2/28/85, effective 4/1/85; 84-24-016 (Order 84-23), § 296-17-350, filed 11/28/84, effective 1/1/85. Statutory Authority: RCW 51.04.020(1). 84-11-034 (Order 84-11), § 296-17-350, filed 5/15/84. Statutory Authority: RCW 51.16.035. 83-24-017 (Order 83-36), § 296-17-350, filed 11/30/83, effective 1/1/84; 81-24-042 (Order 81-30), § 296-17-350, filed 11/30/81, effective 1/1/82. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-350, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-350, filed 11/30/77, effective 1/1/78; Order 77-10, § 296-17-350, filed 5/31/77; Order 76-18, § 296-17-350, filed 5/28/76, effective 7/1/76; Order 75-28, § 296-17-350, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-350, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-350, filed 11/9/73, effective 1/1/74.]

WAC 296-17-35201 Recordkeeping and retention. Washington law (RCW 51.48.030) requires every employer to make, keep, and preserve records which are adequate to facilitate the determination of premiums due to the state for workers' compensation insurance for their covered workers. In the administration of Title 51 RCW, the department of labor and industries has deemed the records and information required in the various subsections of this section to be essential in the determination of premiums due to the state fund. The records so specified and required, shall be provided at the time of audit to any authorized representative of the department who has requested them.

Failure to produce the requested records within thirty days of the request, or within an agreed upon time period shall constitute prima facie evidence of noncompliance with this rule and shall invoke the statutory bar to challenge found in RCW 51.48.030 and/or RCW 51.48.040.

(1) **Employment records.** Every employer shall with respect to each worker, make, keep, and preserve original records containing all of the following information for three full calendar years following the calendar year in which employment occurred:

- (a) The name of each worker;
- (b) The Social Security number of each worker;
- (c) The beginning date of employment for each worker and, if applicable, the separation date of employment of each such worker;
- (d) The basis upon which wages are paid to each worker;

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(e) The number of units earned or produced for each worker paid on a piecework basis;

(f) The risk classification applicable to each worker whenever the worker hours of any one employee are being divided between two or more classifications;

(g) The number of actual hours worked (WAC 296-17-320(15)) by each worker, unless another basis of computing hours worked is prescribed in WAC 296-17-350;

(h) A summary time record for each worker showing the calendar day or days of the week work was performed and the actual number of hours worked each work day;

(i) The workers' total gross pay period earnings;

(j) The specific sums withheld from the earnings of each worker, and the purpose of each sum withheld;

(k) The net pay earned by each such worker.

(2) **Business, financial records, and record retention.**

Every employer is required to keep and preserve all original employment time records for three full calendar years following the calendar year in which employment occurred. The three-year period is specified in WAC 296-17-352 as the composite period from the date any such premium became due.

Employers who pay their workers by check are required to keep and preserve all check registers and bank statements. Employers who pay their workers by cash are required to keep and preserve records of these cash transactions which provide a detailed record of wages paid to each worker.

(3) **Recordkeeping - Estimated premium computation.** Any employer required by this section to make, keep, and preserve records containing the information as specified in subsections (1) and (2) of this section, who fails to make, keep, and preserve such records, shall for the purpose of premium calculation assume worker hours using the average hourly wage rate for each classification, and also will be subject to penalties prescribed in subsection (4) of this section. The records of the department as compiled for the preceding fiscal year ending June 30, shall be the basis for determining the average hourly wage rate: *Provided*, That the average hourly wage rate shall be no less than the state minimum wage existing at the time such assumed hours are worked. Notwithstanding any other provisions of this section, workers employed in a work activity center subject to Classification 7309 shall be reported on the basis of the average hourly wage.

(4) **Failure to maintain records - Penalties.** Any employer required by this section to make, keep, and preserve records containing the information as specified in subsections (1) and (2) of this section, who fails to make, keep, and preserve such record, shall be liable, subject to RCW 51.48.030, to a penalty in the amount of two hundred fifty dollars for each such offense. Failure to make, keep, and preserve records containing the information as specified in subsections (1) and (2) of this section, for a single employee shall constitute one offense, for two employees two offenses, and so forth.

[Statutory Authority: RCW 51.04.020. 95-08-052, § 296-17-35201, filed 4/3/95, effective 7/1/95.]

WAC 296-17-855 Experience modification. The basis of the experience modification shall be a comparison of the actual losses charged to an employer during the

experience period with the losses which would be expected for an average employer reporting the same exposures in each classification. The comparison shall contain actuarial refinements designed to mitigate the effects of losses which may be considered catastrophic or of doubtful statistical significance, due consideration being given to the volume of the employer's experience. Except for those employers who qualify for an adjusted experience modification as specified in WAC 296-17-860 or 296-17-865, the experience modification shall be calculated from the formula:

$$\text{MODIFICATION} = \frac{\text{Ap} + \text{WAe} + (1-\text{W}) \text{Ee} + \text{B}}{\text{E} + \text{B}}$$

The components Ap, WAe, and (1-W) Ee are values which shall be charged against an employer's experience record. The component, E, shall be the expected value of these charges for an average employer reporting the same exposures in each classification. The meaning and function of each symbol in the formula is specified below.

"Ap" signifies "primary actual losses." For each claim the primary actual loss is defined as that portion of the claim which is considered completely rateable for all employers and which is to enter the experience modification calculation at its full value. For each claim in excess of \$9,517 the primary actual loss shall be determined from the formula:

$$\text{PRIMARY LOSS} = \frac{23,793}{\text{Total loss} + 14,276} \times \text{total loss}$$

Primary actual losses for selected claim values are shown in Table I. For each claim less than \$9,517 the full value of the claim shall be considered a primary loss.

"Ae" signifies "excess actual losses." For each claim the excess actual loss is defined as that portion of the claim which is not considered completely rateable for all employers. The excess actual loss for each claim shall be determined by subtracting the primary loss from the total loss.

"W" signifies "W value." For each employer, the W value determines the portion of the actual excess losses which shall be included in the calculation of his experience modification, due consideration being given to the volume of his experience. This amount is represented by the symbol "WAe" in the experience modification formula. W values are set forth in Table II.

"E" signifies "expected losses." An employer's expected losses shall be determined by multiplying his reported exposure in each classification during the experience period by the classification expected loss rate. Expected loss rates are set forth in Table III.

"Ee" signifies "expected excess losses." Expected losses in each classification shall be multiplied by the classification "D-Ratio" to obtain "expected primary losses." Expected excess losses shall then be calculated by subtracting expected primary losses from expected total losses. Each employer shall have a statistical charge included in the calculation of his experience modification, said charge to be actuarially equivalent to the amount forgiven an average employer because of the exclusion of a portion of his excess actual losses. This charge is represented by "(1-W) Ee" in the experience modification formula. D-Ratios are set forth in Table III.

"B" signifies "B value" or "ballast." In order to limit the effect of a single severe accident on the modification of a small employer, a stabilizing element (B value) shall be added to both actual and expected losses. B values are set forth in Table II.

[Statutory Authority: RCW 51.04.020, 95-23-080, § 296-17-855, filed 11/20/95, effective 1/1/96; 94-24-007, § 296-17-855, filed 11/28/94, effective 1/1/95; 93-24-114, § 296-17-855, filed 12/1/93, effective 1/1/94. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 93-12-093, § 296-17-855, filed 5/31/93, effective 7/1/93; 92-24-063, § 296-17-855, filed 11/30/92, effective 1/1/93; 91-24-053, § 296-17-855, filed 11/27/91, effective 1/1/92; 90-24-042, § 296-17-855, filed 11/30/90, effective 1/1/91; 89-24-051 (Order 89-22), § 296-17-855, filed 12/1/89, effective 1/1/90. Statutory Authority: RCW 51.16.035 and 51.04.020, 88-24-012 (Order 88-30), § 296-17-855, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035, 87-24-060 (Order 87-26), § 296-17-855, filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 86-24-042 (Order 86-41), § 296-17-855, filed 11/26/86. Statutory Authority: RCW 51.16.035, 85-24-032 (Order 85-33), § 296-17-855, filed 11/27/85, effective 1/1/86; 84-24-016 (Order 84-23), § 296-17-855, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-855, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-855, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-855, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-855, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035, 79-12-086 (Order 79-18), § 296-17-855, filed 11/30/79, effective 1/1/80; Order 77-27, § 296-17-855, filed 11/30/77, effective 1/1/78; Order 74-40, § 296-17-855, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-855, filed 11/9/73, effective 1/1/74.]

WAC 296-17-875 Table I.

Primary Losses for Selected Claim Values

CLAIM VALUE	PRIMARY LOSS
9,517	9,517
10,350	10,000
12,275	11,000
14,526	12,000
17,195	13,000
20,409	14,000
24,353	15,000
29,310	16,000
44,358	18,000
133,524*	21,495
237,930**	22,446

* Average death value

** Maximum claim value

[Statutory Authority: RCW 51.04.020, 95-23-080, § 296-17-875, filed 11/20/95, effective 1/1/96; 94-24-007, § 296-17-875, filed 11/28/94, effective 1/1/95; 93-24-114, § 296-17-875, filed 12/1/93, effective 1/1/94. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 92-24-063, § 296-17-875, filed 11/30/92, effective 1/1/93; 91-24-053, § 296-17-875, filed 11/27/91, effective 1/1/92; 90-24-042, § 296-17-875, filed 11/30/90, effective 1/1/91; 89-24-051 (Order 89-22), § 296-17-875, filed 12/1/89, effective 1/1/90. Statutory Authority: RCW 51.16.035 and 51.04.020, 88-24-012 (Order 88-30), § 296-17-875, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035, 87-24-060 (Order 87-26), § 296-17-875, filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 86-24-042 (Order 86-41), § 296-17-875, filed 11/26/86. Statutory Authority: RCW 51.16.035, 86-12-041 (Order 86-18), § 296-17-875, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-875, filed 11/27/85, effective 1/1/86; 84-24-016 (Order 84-23), § 296-17-875, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-875, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-875, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-875, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-875, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035, 79-12-086 (Order 79-18), § 296-17-875, filed

11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-875, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-875, filed 11/30/77, effective 1/1/78; Order 76-36, § 296-17-875, filed 11/30/76; Order 75-38, § 296-17-875, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-875, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-875, filed 11/9/73, effective 1/1/74.]

WAC 296-17-880 Table II.

"B" and "W" Values

Maximum Claim Value = \$237,930

Average Death Value = \$133,524

Expected Losses		B	W
5,154 & Under		44,892	0.00
5,155 - 10,386		44,443	0.01
10,387 - 15,697		43,994	0.02
15,698 - 21,087		43,545	0.03
21,088 - 26,560		43,096	0.04
26,561 - 32,118		42,647	0.05
32,119 - 37,762		42,198	0.06
37,763 - 43,495		41,750	0.07
43,496 - 49,319		41,301	0.08
49,320 - 55,236		40,852	0.09
55,237 - 61,250		40,403	0.10
61,251 - 67,361		39,954	0.11
67,362 - 73,574		39,505	0.12
73,575 - 79,891		39,056	0.13
79,892 - 86,315		38,607	0.14
86,316 - 92,848		38,158	0.15
92,849 - 99,494		37,709	0.16
99,495 - 106,256		37,260	0.17
106,257 - 113,136		36,811	0.18
113,137 - 120,140		36,363	0.19
120,141 - 127,269		35,914	0.20
127,270 - 134,528		35,465	0.21
134,529 - 141,921		35,016	0.22
141,922 - 149,451		34,567	0.23
149,452 - 157,123		34,118	0.24
157,124 - 164,940		33,669	0.25
164,941 - 172,908		33,220	0.26
172,909 - 181,031		32,771	0.27
181,032 - 189,314		32,322	0.28
189,315 - 197,762		31,873	0.29
197,763 - 206,380		31,424	0.30
206,381 - 215,174		30,975	0.31
215,175 - 224,149		30,527	0.32
224,150 - 233,311		30,078	0.33
233,312 - 242,668		29,629	0.34
242,669 - 252,224		29,180	0.35
252,225 - 261,987		28,731	0.36
261,988 - 271,965		28,282	0.37
271,966 - 282,164		27,833	0.38
282,165 - 292,592		27,384	0.39
292,593 - 303,258		26,935	0.40
303,259 - 314,170		26,486	0.41
314,171 - 325,338		26,037	0.42
325,339 - 336,770		25,588	0.43
336,771 - 348,477		25,140	0.44
348,478 - 360,468		24,691	0.45
360,469 - 372,756		24,242	0.46
372,757 - 385,351		23,793	0.47
385,352 - 398,266		23,344	0.48

398,267	-	411,513	22,895	0.49
411,514	-	425,106	22,446	0.50
425,107	-	439,059	21,997	0.51
439,060	-	453,388	21,548	0.52
453,389	-	468,107	21,099	0.53
468,108	-	483,234	20,650	0.54
483,235	-	498,787	20,201	0.55
498,788	-	514,783	19,752	0.56
514,784	-	531,244	19,304	0.57
531,245	-	548,190	18,855	0.58
548,191	-	565,644	18,406	0.59
565,645	-	583,629	17,957	0.60
583,630	-	602,171	17,508	0.61
602,172	-	621,296	17,059	0.62
621,297	-	641,034	16,610	0.63
641,035	-	661,414	16,161	0.64
661,415	-	682,471	15,712	0.65
682,472	-	704,238	15,263	0.66
704,239	-	726,753	14,814	0.67
726,754	-	750,056	14,365	0.68
750,057	-	774,190	13,917	0.69
774,191	-	799,201	13,468	0.70
799,202	-	825,139	13,019	0.71
825,140	-	852,058	12,570	0.72
852,059	-	880,014	12,121	0.73
880,015	-	909,071	11,672	0.74
909,072	-	939,296	11,223	0.75
939,297	-	970,761	10,774	0.76
970,762	-	1,003,546	10,325	0.77
1,003,547	-	1,037,737	9,876	0.78
1,037,738	-	1,073,427	9,427	0.79
1,073,428	-	1,110,720	8,978	0.80
1,110,721	-	1,149,726	8,529	0.81
1,149,727	-	1,190,568	8,081	0.82
1,190,569	-	1,233,381	7,632	0.83
1,233,382	-	1,278,311	7,183	0.84
1,278,312	-	1,325,523	6,734	0.85
1,325,524	-	1,375,196	6,285	0.86
1,375,197	-	1,427,530	5,836	0.87
1,427,531	-	1,482,747	5,387	0.88
1,482,748	-	1,541,093	4,938	0.89
1,541,094	-	1,602,844	4,489	0.90
1,602,845	-	1,668,311	4,040	0.91
1,668,312	-	1,737,842	3,591	0.92
1,737,843	-	1,811,829	3,142	0.93
1,811,830	-	1,890,719	2,694	0.94
1,890,720	-	1,975,019	2,245	0.95
1,975,020	-	2,065,308	1,796	0.96
2,065,309	-	2,162,252	1,347	0.97
2,162,253	-	2,266,619	898	0.98
2,266,620	-	2,379,299	449	0.99
2,379,300 & Over			0	1.00

[Statutory Authority: RCW 51.04.020. 95-23-080, § 296-17-880, filed 11/20/95, effective 1/1/96; 94-24-007, § 296-17-880, filed 11/28/94, effective 1/1/95; 93-24-114, § 296-17-880, filed 12/1/93, effective 1/1/94. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 92-24-063, § 296-17-880, filed 11/30/92, effective 1/1/93; 91-24-053, § 296-17-880, filed 11/27/91, effective 1/1/92; 90-24-042, § 296-17-880, filed 11/30/90, effective 1/1/91; 89-24-051 (Order 89-22), § 296-17-880, filed 12/1/89, effective 1/1/90. Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-880, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-880, filed 12/1/87, effective 1/1/88. Statutory Authority: RCW

51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-880, filed 11/26/86. Statutory Authority: RCW 51.16.035. 85-24-032 (Order 85-33), § 296-17-880, filed 11/27/85, effective 1/1/86; 84-24-016 (Order 84-23), § 296-17-880, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-880, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-880, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-880, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-880, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-880, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-880, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-880, filed 11/30/77, effective 1/1/78; Order 76-36, § 296-17-880, filed 11/30/76; Order 75-38, § 296-17-880, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-880, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-880, filed 11/9/73, effective 1/1/74.]

WAC 296-17-885 Table III.

Expected Loss Rates and D-Ratios
Expected Loss Rates in Dollars Per Worker Hour
for Indicated Fiscal Year

Class	1991	1992	1993	D-Ratio
0101	1.1989	1.0752	0.9885	0.398
0102	1.2669	1.1374	1.0465	0.425
0103	1.5214	1.3659	1.2576	0.457
0104	1.7115	1.5300	1.4001	0.339
0105	1.2527	1.1293	1.0413	0.476
0107	1.1592	1.0384	0.9544	0.428
0108	0.8302	0.7458	0.6867	0.455
0109	3.4617	3.0918	2.8359	0.384
0201	2.8121	2.5152	2.3078	0.359
0202	2.9836	2.6736	2.4572	0.440
0206	1.6044	1.4330	1.3142	0.394
0301	0.6061	0.5490	0.5070	0.519
0302	1.8073	1.6143	1.4807	0.374
0306	0.8818	0.7931	0.7300	0.454
0307	0.6904	0.6234	0.5750	0.508
0403	1.4108	1.2710	1.1708	0.455
0502	1.2405	1.1111	1.0209	0.415
0504	1.3263	1.1890	1.0932	0.410
0506	4.1578	3.7193	3.4136	0.390
0507	3.0705	2.7609	2.5423	0.427
0508	3.0159	2.6868	2.4589	0.360
0509	1.5651	1.4016	1.2869	0.396
0510	1.2750	1.1469	1.0564	0.461
0511	0.9657	0.8718	0.8044	0.536
0512	1.5555	1.3976	1.2862	0.448
0513	0.6610	0.5942	0.5471	0.460
0514	1.2750	1.1469	1.0564	0.469
0515	2.5374	2.2693	2.0844	0.402
0516	1.2750	1.1469	1.0564	0.469
0517	1.5296	1.3804	1.2740	0.496
0518	1.4257	1.2770	1.1732	0.410
0519	1.5475	1.3949	1.2846	0.431
0601	0.6196	0.5585	0.5146	0.477
0602	0.3697	0.3338	0.3085	0.555
0603	0.8873	0.7953	0.7307	0.391
0604	1.1480	1.0367	0.9553	0.467
0606	0.2652	0.2415	0.2236	0.602
0607	0.2814	0.2557	0.2362	0.558
0608	0.2969	0.2693	0.2485	0.486
0701	2.0444	1.8157	1.6592	0.335
0803	0.3212	0.2908	0.2685	0.552
0804	0.8810	0.7902	0.7259	0.406

0901	1.4268	1.2821	1.1794	0.449
1002	0.7252	0.6563	0.6064	0.536
1003	0.6730	0.6068	0.5593	0.486
1004	0.4867	0.4389	0.4043	0.474
1005	5.2607	4.7066	4.3257	0.402
1007	0.3120	0.2816	0.2597	0.506
1101	0.5120	0.4645	0.4295	0.557
1102	1.1239	1.0110	0.9319	0.461
1103	0.5018	0.4542	0.4197	0.522
1104	0.4772	0.4337	0.4011	0.544
1106	0.2400	0.2193	0.2028	0.576
1108	0.3976	0.3612	0.3332	0.528
1109	0.6910	0.6277	0.5796	0.497
1301	0.3565	0.3231	0.2986	0.527
1303	0.1595	0.1444	0.1334	0.552
1304	0.0210	0.0191	0.0177	0.550
1305	0.3568	0.3238	0.2992	0.542
1401	0.5826	0.5277	0.4877	0.509
1404	0.4894	0.4426	0.4089	0.535
1405	0.4698	0.4254	0.3920	0.483
1501	0.3530	0.3193	0.2950	0.532
1507	0.2760	0.2507	0.2318	0.579
1701	1.5265	1.3647	1.2510	0.370
1702	1.5925	1.4254	1.3074	0.365
1703	0.3183	0.2873	0.2650	0.514
1704	0.7185	0.6469	0.5954	0.426
1801	0.8112	0.7292	0.6706	0.437
1802	0.9892	0.8892	0.8191	0.458
2002	0.5153	0.4685	0.4335	0.583
2003	0.3633	0.3302	0.3051	0.558
2004	0.5465	0.4961	0.4589	0.579
2007	0.4514	0.4095	0.3784	0.521
2008	0.2472	0.2237	0.2064	0.511
2009	0.2997	0.2727	0.2522	0.568
2101	0.5491	0.4970	0.4590	0.498
2102	0.4088	0.3721	0.3444	0.596
2104	0.2452	0.2238	0.2072	0.597
2105	0.4801	0.4337	0.4007	0.550
2106	0.3119	0.2832	0.2615	0.536
2201	0.2304	0.2087	0.1928	0.517
2202	0.5305	0.4827	0.4470	0.608
2203	0.2663	0.2426	0.2242	0.569
2401	0.3965	0.3605	0.3330	0.514
2903	0.6185	0.5621	0.5199	0.556
2904	0.6783	0.6150	0.5678	0.508
2905	0.4520	0.4114	0.3805	0.574
2906	0.3003	0.2715	0.2502	0.514
2907	0.4749	0.4313	0.3990	0.570
2908	0.8763	0.7936	0.7335	0.552
2909	0.4871	0.4425	0.4093	0.572
3101	0.7388	0.6651	0.6124	0.434
3102	0.2890	0.2626	0.2429	0.577
3103	0.6996	0.6303	0.5805	0.463
3104	0.4524	0.4082	0.3764	0.505
3105	0.7311	0.6616	0.6107	0.516
3303	0.2180	0.1980	0.1828	0.549
3304	0.5465	0.4959	0.4583	0.539
3309	0.3716	0.3381	0.3129	0.556
3401	0.3679	0.3330	0.3073	0.521
3402	0.4474	0.4047	0.3736	0.524
3403	0.1977	0.1788	0.1646	0.471

3404	0.4314	0.3915	0.3618	0.550	4903	0.0443	0.0402	0.0371	0.554
3405	0.2874	0.2598	0.2396	0.521	4904	0.0234	0.0214	0.0198	0.629
3406	0.2210	0.2011	0.1859	0.578	4905	0.2407	0.2204	0.2043	0.638
3407	0.2826	0.2567	0.2374	0.571	4906	0.0704	0.0640	0.0591	0.575
3408	0.0910	0.0825	0.0762	0.529	4907	0.0583	0.0529	0.0488	0.535
3409	0.0888	0.0810	0.0749	0.586	4908	0.1001	0.0926	0.0857	0.621
3410	0.1925	0.1758	0.1628	0.586	4909	0.0494	0.0457	0.0422	0.605
3501	0.8488	0.7658	0.7065	0.461	4910	0.3591	0.3264	0.3016	0.531
3503	0.2890	0.2646	0.2453	0.564	5001	3.8664	3.4557	3.1723	0.380
3506	0.7684	0.6896	0.6349	0.493	5002	0.4531	0.4105	0.3795	0.562
3509	0.3716	0.3384	0.3137	0.629	5003	1.3737	1.2299	1.1302	0.395
3510	0.3858	0.3507	0.3244	0.584	5004	1.5457	1.3982	1.2898	0.481
3511	0.5674	0.5147	0.4755	0.541	5005	1.1989	1.0752	0.9885	0.398
3512	0.3524	0.3218	0.2978	0.585	5101	0.6854	0.6241	0.5783	0.613
3602	0.1011	0.0923	0.0854	0.596	5103	0.6265	0.5703	0.5278	0.587
3603	0.3843	0.3503	0.3241	0.561	5106	0.6261	0.5689	0.5251	0.523
3604	1.2508	1.1333	1.0482	0.572	5108	0.5557	0.5025	0.4636	0.518
3605	0.4256	0.3856	0.3563	0.546	5109	0.5730	0.5170	0.4763	0.487
3701	0.2479	0.2250	0.2077	0.519	5201	0.2934	0.2656	0.2452	0.541
3702	0.4443	0.4027	0.3724	0.571	5204	0.9101	0.8225	0.7582	0.487
3707	0.5192	0.4728	0.4373	0.458	5206	0.4570	0.4117	0.3790	0.456
3708	0.3386	0.3075	0.2844	0.566	5207	0.1392	0.1277	0.1183	0.645
3801	0.2653	0.2402	0.2214	0.505	5208	0.8143	0.7360	0.6785	0.499
3802	0.1669	0.1520	0.1407	0.599	5209	0.6304	0.5717	0.5284	0.546
3808	0.2847	0.2576	0.2375	0.488	5301	0.0275	0.0251	0.0232	0.587
3901	0.1664	0.1515	0.1401	0.587	5305	0.0389	0.0355	0.0328	0.617
3902	0.3683	0.3354	0.3104	0.592	5306	0.0447	0.0407	0.0376	0.544
3903	1.0842	0.9865	0.9109	0.515	5307	0.2933	0.2656	0.2456	0.560
3905	0.1525	0.1398	0.1294	0.626	6103	0.0582	0.0534	0.0495	0.638
3906	0.4797	0.4350	0.4021	0.547	6104	0.2250	0.2052	0.1900	0.588
3909	0.1768	0.1613	0.1492	0.583	6105	0.1732	0.1573	0.1454	0.546
4002	0.7303	0.6591	0.6094	0.556	6107	0.1166	0.1065	0.0984	0.587
4101	0.2084	0.1896	0.1753	0.561	6108	0.4487	0.4089	0.3784	0.578
4103	0.2364	0.2164	0.2007	0.671	6109	0.0581	0.0527	0.0487	0.545
4107	0.1379	0.1256	0.1161	0.553	6110	0.4214	0.3827	0.3541	0.571
4108	0.1620	0.1472	0.1358	0.537	6201	0.2410	0.2182	0.2013	0.512
4109	0.2084	0.1896	0.1753	0.561	6202	0.5339	0.4834	0.4458	0.480
4201	0.3067	0.2762	0.2548	0.513	6203	0.0778	0.0712	0.0660	0.657
4301	0.6996	0.6345	0.5862	0.533	6204	0.1777	0.1622	0.1502	0.611
4302	0.5811	0.5244	0.4849	0.552	6205	0.1777	0.1622	0.1502	0.611
4304	0.5856	0.5317	0.4915	0.543	6206	0.1777	0.1622	0.1502	0.611
4305	0.8488	0.7659	0.7075	0.536	6207	1.1415	1.0463	0.9691	0.585
4401	0.4335	0.3929	0.3627	0.494	6208	0.2490	0.2281	0.2108	0.587
4402	0.6026	0.5474	0.5056	0.548	6209	0.2283	0.2085	0.1928	0.587
4404	0.3847	0.3489	0.3221	0.528	6301	0.1145	0.1034	0.0952	0.467
4501	0.1315	0.1196	0.1105	0.540	6302	0.1486	0.1350	0.1245	0.493
4502	0.0379	0.0345	0.0318	0.559	6303	0.0645	0.0586	0.0541	0.515
4504	0.0863	0.0790	0.0732	0.624	6304	0.1607	0.1471	0.1362	0.602
4601	0.5740	0.5213	0.4819	0.538	6305	0.0678	0.0618	0.0571	0.579
4802	0.2061	0.1874	0.1732	0.558	6306	0.2470	0.2248	0.2080	0.589
4803	0.1983	0.1809	0.1674	0.577	6308	0.0454	0.0413	0.0381	0.560
4804	0.4673	0.4258	0.3942	0.586	6309	0.1246	0.1137	0.1051	0.583
4805	0.2855	0.2590	0.2390	0.517	6402	0.2604	0.2367	0.2190	0.585
4806	0.0597	0.0543	0.0501	0.527	6403	0.1925	0.1758	0.1628	0.586
4808	0.4074	0.3681	0.3395	0.484	6404	0.1402	0.1283	0.1188	0.598
4809	0.2264	0.2064	0.1912	0.616	6405	0.5233	0.4739	0.4375	0.526
4810	0.1376	0.1257	0.1164	0.597	6406	0.0802	0.0733	0.0678	0.603
4811	0.2340	0.2131	0.1970	0.566	6407	0.1896	0.1727	0.1597	0.576
4812	0.2928	0.2656	0.2453	0.544	6408	0.3144	0.2858	0.2645	0.596
4813	0.2128	0.1933	0.1787	0.516	6409	0.4715	0.4266	0.3934	0.503
4901	0.0443	0.0402	0.0371	0.554	6410	0.1488	0.1355	0.1253	0.565
4902	0.0579	0.0525	0.0486	0.580	6501	0.0876	0.0798	0.0740	0.630

6502	0.0254	0.0231	0.0214	0.560
6503	0.0616	0.0555	0.0511	0.476
6504	0.3832	0.3504	0.3244	0.577
6505	0.0934	0.0853	0.0787	0.532
6506	0.0738	0.0674	0.0622	0.546
6508	0.3274	0.2978	0.2754	0.552
6509	0.2221	0.2027	0.1877	0.575
6601	0.1758	0.1605	0.1485	0.588
6602	0.4176	0.3793	0.3506	0.536
6603	0.2678	0.2434	0.2250	0.564
6604	0.0591	0.0538	0.0496	0.500
6605	0.3070	0.2812	0.2607	0.657
6607	0.1453	0.1330	0.1232	0.642
6608	0.2645	0.2385	0.2199	0.483
6620	0.6389	0.5856	0.5443	0.723
6704	0.1213	0.1104	0.1021	0.585
6705	0.7477	0.6844	0.6343	0.635
6706	0.3598	0.3287	0.3039	0.571
6707	1.5575	1.4226	1.3179	0.614
6708	5.4435	4.9745	4.5904	0.463
6709	0.1747	0.1601	0.1485	0.653
6801	0.2259	0.2050	0.1894	0.578
6802	0.3577	0.3275	0.3031	0.633
6803	0.8188	0.7254	0.6602	0.310
6804	0.1775	0.1615	0.1494	0.619
6809	3.9144	3.6146	3.3450	0.623
6901	0.0288	0.0272	0.0252	0.644
6902	0.7234	0.6462	0.5928	0.376
6903	3.5890	3.2206	2.9440	0.348
6904	0.2052	0.1862	0.1722	0.587
6905	0.2402	0.2184	0.2018	0.579
6906	0.1168	0.1105	0.1025	0.679
6907	1.0225	0.9243	0.8540	0.521
6908	0.3749	0.3407	0.3151	0.580
6909	0.0847	0.0773	0.0716	0.603
7101	0.0294	0.0267	0.0246	0.505
7102	3.5471	3.2740	3.0318	0.590
7103	0.2690	0.2431	0.2244	0.502
7104	0.0245	0.0224	0.0207	0.552
7105	0.0265	0.0241	0.0223	0.565
7106	0.1503	0.1361	0.1256	0.507
7107	0.2441	0.2214	0.2046	0.532
7108	0.1971	0.1801	0.1667	0.613
7109	0.2064	0.1882	0.1739	0.565
7110	0.3205	0.2891	0.2665	0.476
7111	0.4442	0.4027	0.3722	0.517
7112	0.5802	0.5250	0.4844	0.514
7113	0.5978	0.5394	0.4968	0.487
7114	0.6635	0.6071	0.5620	0.604
7115	0.5073	0.4597	0.4243	0.534
7116	0.5244	0.4742	0.4374	0.484
7117	1.2706	1.1577	1.0725	0.547
7118	2.4711	2.2381	2.0637	0.528
7119	1.7427	1.5751	1.4531	0.513
7120	5.1841	4.6913	4.3196	0.453
7121	5.4012	4.8810	4.4974	0.463
7201	0.8908	0.8030	0.7419	0.518
7202	0.0477	0.0433	0.0400	0.516
7203	0.1174	0.1076	0.0994	0.567
7204	0.0000	0.0000	0.0000	0.644
7301	0.5072	0.4590	0.4241	0.525

7302	0.5870	0.5344	0.4939	0.538
7307	0.6025	0.5484	0.5069	0.552
7308	0.2174	0.1991	0.1843	0.608
7309	0.1747	0.1601	0.1485	0.653

[Statutory Authority: RCW 51.04.020. 95-23-080, § 296-17-885, filed 11/20/95, effective 1/1/96; 94-24-007, § 296-17-885, filed 11/28/94, effective 1/1/95; 93-24-114, § 296-17-885, filed 12/1/93, effective 1/1/94. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 92-24-063, § 296-17-885, filed 11/30/92, effective 1/1/93; 91-24-053, § 296-17-885, filed 11/27/91, effective 1/1/92; 91-12-014, § 296-17-885, filed 5/31/91, effective 7/1/91; 90-24-042, § 296-17-885, filed 11/30/90, effective 1/1/91; 90-13-018, § 296-17-885, filed 6/8/90, effective 7/9/90; 89-24-051 (Order 89-22), § 296-17-885, filed 12/1/89, effective 1/1/90. Statutory Authority: RCW 51.04.020(1). 89-16-001 (Order 89-07), § 296-17-885, filed 7/20/89, effective 8/20/89. Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-885, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-885, filed 5/31/88; 88-12-050 (Order 88-06), § 296-17-885, filed 5/31/88, effective 7/1/88; 88-06-047 (Order 87-33), § 296-17-885, filed 3/1/88; 87-24-060 (Order 87-26), § 296-17-885, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-885, filed 5/29/87, effective 7/1/87. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-885, filed 11/26/86. Statutory Authority: RCW 51.16.035. 86-12-041 (Order 86-18), § 296-17-885, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-885, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-885, filed 2/28/85, effective 4/1/85; 84-24-016 (Order 84-23), § 296-17-885, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-885, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-885, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-885, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-885, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-885, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-885, filed 11/27/78, effective 1/1/79, effective 1/1/80. Order 77-27, § 296-17-885, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-885, filed 12/1/77; Order 77-10, § 296-17-885, filed 5/31/77; Order 76-36, § 296-17-885, filed 11/30/76; Order 76-18, § 296-17-885, filed 5/28/76, effective 7/1/76; Order 75-38, § 296-17-885, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-885, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-885, filed 11/9/73, effective 1/1/74.]

WAC 296-17-890 Table IV.

Maximum experience modifications
for firms with no compensable accidents:

Expected Loss Range	Maximum Experience Modification
2,252 & Under	0.90
2,253 - 2,409	0.89
2,410 - 2,580	0.88
2,581 - 2,764	0.87
2,765 - 2,964	0.86
2,965 - 3,181	0.85
3,182 - 3,417	0.84
3,418 - 3,674	0.83
3,675 - 3,953	0.82
3,954 - 4,258	0.81
4,259 - 4,590	0.80
4,591 - 4,953	0.79
4,954 - 5,349	0.78
5,350 - 5,784	0.77
5,785 - 6,260	0.76
6,261 - 6,782	0.75
6,783 - 7,356	0.74
7,357 - 7,987	0.73

7,988	- 8,682	0.72	0504	1.5926	0.6164
8,683	- 9,449	0.71	0506	5.1355	1.8101
9,450	- 10,296	0.70	0507	3.4887	1.5784
10,297	- 11,233	0.69	0508	3.9724	1.1176
11,234	- 12,271	0.68	0509	1.8942	0.7103
12,272	- 13,423	0.67	0510	1.4694	0.6454
13,424	- 14,702	0.66	0511	1.0721	0.5259
14,703	- 16,127	0.65	0512	1.8231	0.7620
16,128	- 17,714	0.64	0513	0.7743	0.3254
17,715	- 19,487	0.63	0514	1.4694	0.6454
19,488	- 21,471	0.62	0515	3.1835	1.0775
21,472	- 23,694	0.61	0516	1.4694	0.6454
23,695 & Over		0.60	0517	1.6642	0.8519
			0518	1.7432	0.6389
			0519	1.6574	0.8660
			0601	0.6904	0.3315
			0602	0.4142	0.2003
			0603	1.0539	0.4178
			0604	1.2062	0.6635
			0606	0.2494	0.1791
			0607	0.2704	0.1837
			0608	0.2834	0.1929
			0701	2.8143	0.6631
			0803	0.3385	0.1885
			0804	1.0371	0.4216
			0901	1.6607	0.7050
			1002	0.7664	0.4244
			1003	0.7456	0.3635
			1004	0.5326	0.2664
			1005	6.5179	2.2936
			1007	0.3419	0.1720
			1101	0.5148	0.3196
			1102	1.2942	0.5709
			1103	0.5178	0.3014
			1104	0.4510	0.3173
			1106	0.2010	0.1785
			1108	0.3764	0.2618
			1109	0.6371	0.4659
			1301	0.3563	0.2224
			1303	0.1687	0.0933
			1304	0.0194	0.0143
			1305	0.3498	0.2279
			1401	0.5856	0.3604
			1404	0.5199	0.2839
			1405	0.4696	0.2892
			1501	0.3728	0.2062
			1507	0.2707	0.1773
			1701	1.8836	0.6601
			1702	1.9135	0.7256
			1703	0.3517	0.1739
			1704	0.7873	0.3885
			1801	0.9288	0.4103
			1802	1.1467	0.4951
			2002	0.4988	0.3366
			2003	0.3486	0.2379
			2004	0.5495	0.3423
			2007	0.4413	0.2883
			2008	0.2531	0.1489
			2009	0.2825	0.2007
			2101	0.5575	0.3345
			2102	0.3887	0.2727
			2104	0.2166	0.1754

[Statutory Authority: RCW 51.04.020. 95-23-080, § 296-17-890, filed 11/20/95, effective 1/1/96; 94-24-007, § 296-17-890, filed 11/28/94, effective 1/1/95; 93-24-114, § 296-17-890, filed 12/1/93, effective 1/1/94. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 92-24-063, § 296-17-890, filed 11/30/92, effective 1/1/93; 91-24-053, § 296-17-890, filed 11/27/91, effective 1/1/92; 90-24-042, § 296-17-890, filed 11/30/90, effective 1/1/91; 89-24-051 (Order 89-22), § 296-17-890, filed 12/1/89, effective 1/1/90. Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-890, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-890, filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-890, filed 11/26/86. Statutory Authority: RCW 51.16.035. 85-24-032 (Order 85-33), § 296-17-890, filed 11/27/85, effective 1/1/86; 84-24-016 (Order 84-23), § 296-17-890, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-890, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-890, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-890, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-890, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-890, filed 11/30/79, effective 1/1/80.]

WAC 296-17-895 Industrial insurance accident fund base rates and medical aid base rates by class of industry. Industrial insurance accident fund and medical aid fund base rates by class of industry shall be as set forth below.

Base Rates Effective
January 1, 1996

Class	Accident Fund	Medical Aid Fund
0101	1.4172	0.5715
0102	1.4854	0.6170
0103	1.8132	0.7254
0104	2.0801	0.7529
0105	1.3798	0.6819
0107	1.4288	0.5140
0108	0.9758	0.4055
0109	4.3956	1.4176
0201	3.4169	1.2550
0202	3.6615	1.3351
0206	2.0484	0.6502
0301	0.6195	0.3680
0302	2.2865	0.7455
0306	1.0155	0.4454
0307	0.7527	0.3840
0403	1.5550	0.7622
0502	1.5176	0.5555

Workers' Compensation Insurance

296-17-895

2105	0.5301	0.2652	4201	0.3532	0.1573
2106	0.3026	0.2009	4301	0.6919	0.4417
2201	0.2343	0.1407	4302	0.6578	0.3106
2202	0.5112	0.3500	4304	0.5683	0.3786
2203	0.2409	0.1850	4305	0.9549	0.4554
2401	0.3615	0.2710	4401	0.4242	0.2749
2903	0.5959	0.4045	4402	0.5802	0.3923
2904	0.6647	0.4304	4404	0.3797	0.2428
2905	0.4210	0.3061	4501	0.1213	0.0892
2906	0.3179	0.1733	4502	0.0350	0.0257
2907	0.4682	0.3037	4504	0.0708	0.0657
2908	0.9149	0.5218	4601	0.5520	0.3744
2909	0.4764	0.3140	4802	0.1959	0.1365
3101	0.8167	0.3955	4803	0.1749	0.1416
3102	0.2806	0.1879	4804	0.4269	0.3238
3103	0.7763	0.3747	4805	0.2778	0.1826
3104	0.4980	0.2476	4806	0.0553	0.0402
3105	0.7579	0.4351	4808	0.4313	0.2347
3303	0.2107	0.1412	4809	0.2102	0.1553
3304	0.5411	0.3456	4810	0.1175	0.1012
3309	0.3439	0.2532	4811	0.2118	0.1623
3401	0.3827	0.2183	4812	0.2908	0.1842
3402	0.4719	0.2611	4813	0.1999	0.1416
3403	0.2034	0.1172	4901	0.0448	0.0273
3404	0.4293	0.2718	4902	0.0588	0.0358
3405	0.3065	0.1646	4903	0.0448	0.0273
3406	0.2081	0.1481	4904	0.0211	0.0166
3407	0.2785	0.1807	4905	0.1988	0.1832
3408	0.0891	0.0580	4906	0.0694	0.0450
3409	0.0795	0.0626	4907	0.0572	0.0371
3410	0.1636	0.1420	4908	0.0546	0.0954
3501	0.9078	0.4806	4909	0.0275	0.0466
3503	0.2249	0.2278	4910	0.3382	0.2390
3506	0.9452	0.3481	5001	4.8459	1.6341
3509	0.3570	0.2475	5002	0.4719	0.2711
3510	0.3762	0.2501	5003	1.6736	0.6180
3511	0.5641	0.3567	5004	1.5740	0.9331
3512	0.3006	0.2589	5005	1.4172	0.5715
3602	0.0895	0.0721	5101	0.6534	0.4584
3603	0.3388	0.2735	5103	0.5867	0.4236
3604	1.3109	0.7452	5106	0.5849	0.4178
3605	0.4369	0.2582	5108	0.5873	0.3225
3701	0.2382	0.1609	5109	0.6227	0.3175
3702	0.4611	0.2676	5201	0.3060	0.1739
3707	0.4308	0.3834	5204	0.9533	0.5303
3708	0.3314	0.2178	5206	0.5067	0.2445
3801	0.2714	0.1596	5207	0.1086	0.1104
3802	0.1556	0.1136	5208	0.8609	0.4701
3808	0.2900	0.1717	5209	0.6317	0.3935
3901	0.1544	0.1133	5301	0.0255	0.0188
3902	0.3432	0.2503	5305	0.0352	0.0272
3903	0.9713	0.7528	5306	0.0409	0.0306
3905	0.1223	0.1184	5307	0.3101	0.1725
3906	0.4847	0.2968	6103	0.0431	0.0477
3909	0.1554	0.1264	6104	0.1994	0.1602
4002	0.8284	0.3892	6105	0.1665	0.1130
4101	0.1962	0.1394	6107	0.1014	0.0840
4103	0.2041	0.1746	6108	0.4076	0.3121
4107	0.1228	0.0970	6109	0.0558	0.0379
4108	0.1557	0.1053	6110	0.4166	0.2688
4109	0.1962	0.1394	6201	0.2464	0.1455

6202	0.5323	0.3301	6906	0.0000	0.1571
6203	0.0674	0.0572	6907	1.0944	0.5869
6204	0.1567	0.1276	6908	0.3672	0.2416
6205	0.1567	0.1276	6909	0.0754	0.0602
6206	0.1567	0.1276	7101	0.0275	0.0195
6207	0.8677	0.9145	7102	16.56*	24.24*
6208	0.1940	0.1954	7103	0.2839	0.1561
6209	0.1954	0.1670	7104	0.0207	0.0180
6301	0.1205	0.0660	7105	0.0243	0.0182
6302	0.1369	0.0999	7106	0.1510	0.0925
6303	0.0610	0.0426	7107	0.2423	0.1537
6304	0.1302	0.1233	7108	0.1697	0.1442
6305	0.0605	0.0478	7109	0.1819	0.1467
6306	0.2344	0.1648	7110	0.3464	0.1787
6308	0.0431	0.0301	7111	0.4379	0.2811
6309	0.1105	0.0885	7112	0.6007	0.3453
6402	0.2545	0.1687	7113	0.6496	0.3309
6403	0.1636	0.1420	7114	0.5444	0.5040
6404	0.1151	0.1064	7115	0.5157	0.3098
6405	0.5351	0.3172	7116	0.5403	0.3123
6406	0.0687	0.0588	7117	1.1217	0.9047
6407	0.1731	0.1308	7118	2.5270	1.4928
6408	0.3077	0.2036	7119	1.8565	1.0001
6409	0.4872	0.2804	7120	5.1221	3.2106
6410	0.1363	0.1022	7121	5.5649	3.1963
6501	0.0839	0.0585	7201	1.0186	0.4659
6502	0.0221	0.0182	7202	0.0468	0.0303
6503	0.0685	0.0328	7203	0.0877	0.0945
6504	0.3112	0.2923	7204	0.0000	0.0000
6505	0.0762	0.0702	7301	0.5289	0.3009
6506	0.0618	0.0546	7302	0.5251	0.4101
6508	0.3065	0.2201	7307	0.5511	0.4135
6509	0.1910	0.1621	7308	0.1742	0.1680
6601	0.1510	0.1284	7309	0.1408	0.1356
6602	0.4006	0.2731			
6603	0.2564	0.1759			
6604	0.0523	0.0413			
6605	0.2564	0.2323			
6607	0.1220	0.1091			
6608	0.2925	0.1433			
6614	283.7000**	185.0000**			
6615	211.7000**	137.0000**			
6616	27.7000**	16.0000**			
6617	20.7000**	13.0000**			
6618	80.7000**	68.0000**			
6620	0.5566	0.4741			
6704	0.1132	0.0821			
6705	0.6240	0.5642			
6706	0.2995	0.2683			
6707	10.88*	9.04*			
6708	4.0470	4.3290			
6709	0.1408	0.1356			
6801	0.2262	0.1416			
6802	0.2939	0.2721			
6803	1.1663	0.2311			
6804	0.1742	0.1150			
6809	2.3483	3.5833			
6901	0.0000	0.0386			
6902	0.9111	0.3011			
6903	4.0416	1.7992			
6904	0.2107	0.1257			
6905	0.2314	0.1571			

* Daily rate. The daily rate shall be paid in full on any person for any calendar day in which any duties are performed that are incidental to the profession of the worker.

** These rates are calculated on a per license basis for parimutuel race tracks and are base rated.

[Statutory Authority: RCW 51.04.020. 95-23-080, § 296-17-895, filed 11/20/95, effective 1/1/96; 94-24-007, § 296-17-895, filed 11/28/94, effective 1/1/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 94-12-051, § 296-17-895, filed 5/27/94, effective 7/1/94. Statutory Authority: RCW 51.04.020. 93-24-114, § 296-17-895, filed 12/1/93, effective 1/1/94. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 93-12-093, § 296-17-895, filed 5/31/93, effective 7/1/93; 92-24-063, § 296-17-895, filed 11/30/92, effective 1/1/93; 91-24-053, § 296-17-895, filed 11/27/91, effective 1/1/92; 91-12-014, § 296-17-895, filed 5/31/91, effective 7/1/91; 90-24-042, § 296-17-895, filed 11/30/90, effective 1/1/91; 90-13-018, § 296-17-895, filed 6/8/90, effective 7/9/90; 89-24-051 (Order 89-22), § 296-17-895, filed 12/1/89, effective 1/1/90. Statutory Authority: RCW 51.04.020(1). 89-16-001 (Order 89-07), § 296-17-895, filed 7/20/89, effective 8/20/89. Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-895, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-895, filed 5/31/88; 88-12-050 (Order 88-06), § 296-17-895, filed 5/31/88, effective 7/1/88; 88-06-047 (Order 87-33), § 296-17-895, filed 3/1/88; 87-24-060 (Order 87-26), § 296-17-895, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-895, filed 5/29/87, effective 7/1/87. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-895, filed 11/26/86. Statutory Authority: RCW 51.16.035. 86-12-041 (Order 86-18), § 296-17-895, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-895, filed 11/27/85, effective 1/1/86; 85-13-046 (Order 85-13), § 296-17-895, filed 6/17/85; 85-06-026 (Order 85-7), § 296-17-895, filed 2/28/85, effective 4/1/85; 84-24-016 (Order 84-23), § 296-17-895, filed 11/28/84, effective 1/1/85. Statutory Authority: RCW 51.04.020(1). 84-12-048 (Order 84-12), § 296-17-895,

filed 6/1/84. Statutory Authority: RCW 51.16.035. 83-24-017 (Order 83-36), § 296-17-895, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-895, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-895, filed 11/30/81, effective 1/1/82; 81-04-024 (Order 81-02), § 296-17-895, filed 1/30/81; 80-17-016 (Order 80-23), § 296-17-895, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-895, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-895, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-895, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-895, filed 12/1/77; Order 77-10, § 296-17-895, filed 5/31/77; Order 76-36, § 296-17-895, filed 11/30/76; Order 76-18, § 296-17-895, filed 5/28/76, effective 7/1/76; Order 75-38, § 296-17-895, filed 11/24/75, effective 1/1/76; Order 75-28, § 296-17-895, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-895, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-895, filed 11/9/73, effective 1/1/74.]

WAC 296-17-904 Definitions. The definitions in this section shall apply throughout WAC 296-17-905 through 296-17-91902.

(1) "Coverage period" means a one-year period beginning the first day of either January, April, July, or October.

(2) "Group" means those members of an association who have elected to have a group dividend and/or retrospective premium calculated based on the combined premium and incurred loss data of the participants, and have satisfactorily complied with eligibility requirements for doing so.

(3) "Premium" means only that portion of the money collected from an employer for worker's compensation (not to include any money paid in penalties or security deposits), which is deposited in the accident fund and the medical aid fund.

(4) "Standard premium" for a particular coverage period means premium collected or due for insurance coverage provided during the period, prior to any adjustments under a dividend or retrospective rating plan.

(5) "Incurred losses" for a coverage period means the estimated ultimate cost to the accident fund and medical aid fund of claims arising from incidents occurring during the coverage period, subject to the special evaluation methods prescribed in WAC 296-17-915.

(6) "Loss development factor" means an actuarially determined factor which is multiplied times individual case basis estimates of claim costs to produce incurred losses for a firm or group of firms during a coverage period. Loss development factors allow for reopenings, aggravations, and any other individually unpredictable contingencies which may affect claim costs based on past experience of the accident fund and medical aid fund as a whole.

(7) "Loss ratio" means incurred losses divided by standard premium.

(8) "Dividend" is a partial refund of standard premium based on a firm's standard premium and loss ratio.

(9) "Retrospective premium" is a premium determined after a coverage period has ended, based on a firm's standard premium, incurred losses, and other preselected parameters for the coverage period.

(10) "Retrospective premium adjustment" is an additional assessment or refund of premium owing to an employer's retrospective premium as of a given evaluation date being more or less than the premium previously paid for the coverage period. Additional assessments of premium will be deposited entirely in the accident fund and refunds will be paid entirely from the accident fund.

(11) "Performance adjustment factor" means an actuarially determined factor which is multiplied times incurred losses prior to application of the retrospective rating formula. This adjustment will produce an overall net refund or additional assessment for retrospective rating participants, collectively, which is based on the experience of the retrospective rating program as a whole. The purpose of the performance adjustment factor is to retain a consistent economic incentive for participating employers to improve their accident cost experience while participating in these plans.

[Statutory Authority: RCW 51.04.020. 95-06-069, § 296-17-904, filed 3/1/95, effective 4/10/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 91-24-053, § 296-17-904, filed 11/27/91, effective 1/1/92; 88-24-010 (Order 88-26), § 296-17-904, filed 12/1/88, effective 1/1/89. 88-24-010 (Order 88-26), § 296-17-904, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-904, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-904, filed 2/28/85, effective 7/1/85; 81-04-024 (Order 81-02), § 296-17-904, filed 1/30/81.]

WAC 296-17-913 Qualifications for employer participation in a retrospective rating plan. The department may enroll interested employers in a retrospective rating plan as a means of insuring their workers' compensation obligations provided the following conditions are met:

(1) The employer submits to the department no later than the 15th day of the month preceding the start of the coverage period a satisfactorily completed retrospective rating plan agreement for each employer account to be enrolled.

(2) The employer has an industrial insurance account in good standing with the department such that at the time the agreement is processed no outstanding premium, penalties or assessments are due and quarterly reporting of payroll has been made in accordance with WAC 296-17-310.

(3) The employer may be required to post a surety bond or other security deposit separate from the cash deposit required for establishing an industrial insurance account with the department:

(a) The employer's surety bond must be on the prescribed forms authorized by the department;

(b) The employer's surety bond shall be secured in one thousand dollar increments provided further that if the estimated maximum premium falls within two increment ranges, a surety bond at the higher level increment shall be obtained;

(c) The employer's surety bond shall remain in full force and effect for the period required retrospective premium calculations are made.

Such surety bond or security deposit would be sufficient to cover the difference between the employer's estimated standard premium and the maximum premium due under the retrospective rating plan. Past reporting data and current rate levels will be used to determine the estimated standard premium and maximum percentage retrospective premium due under the plan.

(4) The employer maintains any existing retrospective rating account in good standing with the department with no outstanding additional premium assessments or interest therein due at the time the agreement is processed. The department may at its discretion, determine that an employer is in good standing if the employer and the department agree

upon a payment schedule or other arrangements satisfactory to the department for payment of additional premium assessments or interest due. Said payment schedule or other established satisfactory arrangements shall be made prior to the time the agreement is processed.

Final determination as to the employer's eligibility under this section and financial ability to assume the responsibilities under the retrospective rating plan rests with the department subject to review under chapter 51.52 RCW.

[Statutory Authority: RCW 51.04.020. 95-06-069, § 296-17-913, filed 3/1/95, effective 4/10/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 87-12-033 (Order 87-17), § 296-17-913, filed 5/29/87. Statutory Authority: RCW 51.16.035. 85-06-025 (Order 85-8), § 296-17-913, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-913, filed 2/29/84, effective 7/1/84; 82-05-019 (Order 82-5), § 296-17-913, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-913, filed 1/30/81.]

WAC 296-17-914 Retrospective rating formula.

Employers who elect to have their premium adjusted under a retrospective rating plan must submit an application on a form provided by the department. This application must be received by the department no later than the 15th day of the month preceding the start of the coverage period. The employer must preselect a "maximum premium ratio" and either Plan A, A1, A2, A3, or B.

The employer's retrospective premium shall be calculated from the formula:

Retrospective Premium =

(Basic Premium Ratio x Standard Premium)

+

(Loss Conversion Factor x Adjusted Incurred Losses)

In the above formula, the basic premium ratio and loss conversion factor are taken from Plan A (WAC 296-17-91901) or Plan B (WAC 296-17-91902) or Plan A1 (WAC 296-17-91903) or Plan A2 (WAC 296-17-91904) or Plan A3 (WAC 296-17-91905) based on the employer's standard premium and preselected maximum premium ratio. Adjusted incurred losses equal incurred losses times the performance adjustment factor applicable to the coverage period. The performance adjustment factor for each coverage period shall be calculated independently of results for previous coverage periods. Evaluation of incurred losses will be done according to the methods prescribed in WAC 296-17-915.

The maximum retrospective premium is the product of the maximum premium ratio times the employer's standard premium. In the event that the retrospective premium formula produces a value greater than the maximum premium, the retrospective premium shall be reduced to the maximum premium.

Under Plans A1, A2, and A3, the minimum retrospective premium is the product of the minimum premium ratio times the employer's standard premium. If the retrospective premium formula produces a value less than the minimum premium, the retrospective premium shall be increased to the minimum premium.

Under Plan A, a firm may elect to forego the protection of a maximum premium ratio if its financial condition is sufficiently strong and stable so that it could qualify as a self-insurer under the department's guidelines for certification of self-insurers. The basic premium ratio effective January 1, 1989, will be .058 if the firm selects and qualifies for an unlimited maximum premium.

[Statutory Authority: RCW 51.04.020. 95-06-069, § 296-17-914, filed 3/1/95, effective 4/10/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-914, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-914, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-914, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-914, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-914, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-914, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-914, filed 1/30/81.]

WAC 296-17-915 Evaluation of incurred losses dividend and retrospective rating plans. The initial evaluation date for each claim arising from incidents occurring during the coverage period shall be approximately twelve months following the end of the coverage period. Each subsequent annual incurred loss evaluation under the retrospective rating plan shall be approximately twelve months following the preceding evaluation date.

The estimated cost of each claim shall include all payments made as of the valuation date and may also include a reserve for future payments. The claim cost for any one claim or group of claims arising from a single accident shall be limited to a maximum of \$500,000.

[Statutory Authority: RCW 51.04.020. 95-06-069, § 296-17-915, filed 3/1/95, effective 4/10/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-915, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 85-06-025 (Order 85-8), § 296-17-915, filed 2/28/85, effective 7/1/85; 83-05-018 (Order 83-4), § 296-17-915, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-915, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-915, filed 1/30/81.]

WAC 296-17-919 Table I.

RETROSPECTIVE RATING PLANS A, A1, A2, A3, AND B
STANDARD PREMIUM SIZE RANGES
Effective January 1, 1996

Size Group Number	Standard Premium Range
63	\$ 3,577 - \$ 4,323
62	4,324 - 5,189
61	5,190 - 6,175
60	6,176 - 7,307
59	7,308 - 8,600
58	8,601 - 10,056
57	10,057 - 11,712
56	11,713 - 13,588
55	13,589 - 15,681
54	15,682 - 18,040
53	18,041 - 20,694
52	20,695 - 23,640
51	23,641 - 24,912
50	24,913 - 26,812
49	26,813 - 28,887
48	28,888 - 31,179
47	31,180 - 33,714
46	33,715 - 36,501
45	36,502 - 39,598
44	39,599 - 43,049
43	43,050 - 46,864
42	46,865 - 51,137
41	51,138 - 55,936
40	55,937 - 61,281

Workers' Compensation Insurance

296-17-919

39	61,282	-	67,319	15	922,688	-	1,244,645
38	67,320	-	74,162	14	1,244,646	-	1,694,769
37	74,163	-	81,850	13	1,694,770	-	2,054,617
36	81,851	-	90,623	12	2,054,618	-	2,485,083
35	90,624	-	100,670	11	2,485,084	-	3,138,975
34	100,671	-	112,075	10	3,138,976	-	4,512,171
33	112,076	-	121,287	9	4,512,172	-	6,622,189
32	121,288	-	132,172	8	6,622,190	-	9,415,438
31	132,173	-	144,339	7	9,415,439	-	13,872,904
30	144,340	-	158,147	6	13,872,905	-	21,576,453
29	158,148	-	173,884	5	21,576,454	& Over	
28	173,885	-	191,683				
27	191,684	-	212,168				
26	212,169	-	235,863				
25	235,864	-	263,056				
24	263,057	-	294,891				
23	294,892	-	332,415				
22	332,416	-	376,273				
21	376,274	-	428,770				
20	428,771	-	492,160				
19	492,161	-	568,056				
18	568,057	-	661,606				
17	661,607	-	778,298				
16	778,299	-	922,687				

[Statutory Authority: RCW 51.04.020. 95-23-080, § 296-17-919, filed 11/20/95, effective 1/1/96; 95-06-069, § 296-17-919, filed 3/1/95, effective 4/10/95; 94-24-007, § 296-17-919, filed 11/28/94, effective 1/1/95; 93-24-114, § 296-17-919, filed 12/1/93, effective 1/1/94. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 92-24-063, § 296-17-919, filed 11/30/92, effective 1/1/93; 91-24-053, § 296-17-919, filed 11/27/91, effective 1/1/92; 90-24-042, § 296-17-919, filed 11/30/90, effective 1/1/91; 89-24-051 (Order 89-22), § 296-17-919, filed 12/1/89, effective 1/1/90; 88-24-010 (Order 88-26), § 296-17-919, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-919, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-919, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-919, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-919, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-919, filed 2/10/82; 81-24-042 (Order 81-30), § 296-17-919, filed 11/30/81, effective 1/1/82; 81-04-024 (Order 81-02), § 296-17-919, filed 1/30/81.]

WAC 296-17-91901 Table II.

RETROSPECTIVE RATING PLAN A
BASIC PREMIUM RATIOS
LOSS CONVERSION FACTOR = .729
Effective April 10, 1995

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group														
63	.907	.856	.820	.791	.766	.745	.725	.708	.692	.677	.649	.625	.602	.563
62	.902	.850	.813	.783	.757	.735	.715	.698	.681	.666	.638	.612	.590	.550
61	.897	.844	.805	.774	.748	.726	.705	.687	.670	.654	.625	.600	.577	.536
60	.892	.838	.798	.766	.739	.716	.695	.676	.658	.642	.613	.587	.563	.522
59	.888	.831	.790	.758	.730	.706	.684	.665	.647	.630	.600	.574	.550	.508
58	.883	.825	.783	.749	.720	.696	.674	.654	.635	.618	.588	.561	.537	.495
57	.878	.818	.775	.740	.711	.686	.663	.643	.624	.607	.576	.548	.524	.482
56	.872	.810	.766	.731	.701	.675	.652	.631	.612	.594	.563	.535	.511	.468
55	.865	.802	.757	.721	.690	.664	.640	.619	.599	.582	.550	.522	.497	.455
54	.858	.794	.747	.710	.679	.652	.628	.607	.587	.569	.537	.509	.484	.442
53	.851	.785	.738	.700	.668	.641	.616	.595	.575	.556	.524	.496	.471	.429
52	.843	.776	.728	.690	.657	.629	.605	.582	.562	.544	.511	.483	.458	.417
51	.836	.767	.718	.679	.646	.618	.592	.570	.550	.531	.498	.470	.446	.405
50	.828	.758	.708	.668	.634	.605	.580	.557	.537	.518	.485	.457	.432	.392
49	.821	.748	.697	.656	.622	.593	.567	.544	.524	.505	.472	.444	.419	.379
48	.813	.739	.686	.645	.610	.581	.555	.531	.511	.492	.459	.431	.406	.367
47	.804	.729	.675	.633	.598	.568	.542	.519	.498	.479	.446	.418	.394	.355
46	.796	.718	.663	.620	.584	.554	.528	.505	.484	.465	.433	.406	.382	.344
45	.787	.707	.650	.607	.571	.541	.514	.491	.471	.452	.420	.394	.371	.334
44	.778	.695	.638	.594	.557	.527	.501	.478	.458	.440	.408	.382	.360	.324
43	.768	.683	.625	.580	.544	.514	.488	.465	.445	.427	.396	.371	.349	.314
42	.758	.671	.612	.567	.530	.500	.474	.451	.431	.413	.383	.357	.336	.301
41	.748	.659	.599	.554	.517	.486	.460	.437	.417	.399	.368	.343	.322	.288
40	.737	.647	.586	.540	.503	.472	.446	.423	.403	.385	.355	.330	.309	.276
39	.726	.635	.573	.526	.489	.458	.432	.409	.389	.372	.342	.317	.296	.264
38	.714	.622	.560	.513	.476	.445	.418	.396	.376	.359	.329	.305	.284	.252
37	.702	.608	.546	.499	.462	.431	.405	.383	.363	.346	.317	.293	.273	.242
36	.688	.594	.532	.485	.448	.417	.392	.369	.350	.333	.304	.281	.262	.231
35	.673	.578	.516	.469	.433	.402	.377	.355	.336	.320	.292	.269	.250	.221
34	.657	.562	.500	.454	.418	.388	.363	.342	.323	.307	.280	.258	.240	.211
33	.640	.546	.484	.439	.403	.374	.349	.329	.310	.295	.268	.247	.229	.202

32	.623	.529	.468	.424	.389	.360	.336	.316	.298	.283	.257	.237	.220	.193
31	.607	.512	.452	.408	.373	.345	.322	.302	.285	.270	.246	.226	.210	.185
30	.589	.495	.435	.392	.358	.331	.308	.289	.273	.259	.235	.216	.201	.178
29	.571	.478	.419	.377	.344	.317	.295	.277	.261	.247	.225	.207	.193	.171
28	.553	.461	.403	.361	.329	.303	.282	.264	.248	.235	.213	.195	.181	.160
27	.537	.446	.388	.346	.314	.288	.267	.248	.233	.219	.197	.179	.165	.143
26	.521	.430	.373	.331	.299	.273	.252	.234	.218	.205	.183	.165	.151	.129
25	.504	.414	.358	.317	.285	.259	.238	.220	.205	.192	.170	.152	.138	.117
24	.482	.394	.339	.300	.269	.245	.225	.208	.194	.181	.161	.145	.132	.113
23	.460	.374	.321	.283	.254	.231	.213	.197	.184	.172	.153	.138	.127	.109
22	.437	.355	.304	.268	.241	.219	.201	.187	.174	.163	.146	.132	.121	.105
21	.414	.336	.288	.254	.228	.208	.191	.177	.166	.156	.139	.127	.117	.102
20	.394	.318	.272	.239	.214	.194	.179	.166	.155	.145	.130	.119	.110	.096
19	.377	.301	.254	.222	.198	.179	.164	.152	.142	.133	.120	.109	.101	.089
18	.358	.283	.238	.207	.184	.166	.152	.140	.131	.123	.110	.101	.094	.083
17	.339	.266	.222	.192	.171	.154	.140	.130	.121	.114	.103	.094	.088	.079
16	.320	.249	.208	.179	.159	.143	.131	.121	.113	.106	.096	.088	.083	.075
15	.303	.234	.194	.168	.148	.134	.122	.113	.106	.100	.091	.084	.079	.072
14	.293	.220	.180	.157	.141	.128	.117	.109	.103	.097	.089	.082	.078	.071
13	.281	.204	.167	.148	.133	.122	.112	.105	.099	.094	.086	.081	.076	.070
12	.269	.187	.156	.139	.126	.116	.108	.101	.096	.091	.084	.079	.075	.069
11	.254	.167	.145	.130	.119	.110	.103	.097	.092	.088	.082	.077	.073	.068
10	.238	.150	.135	.122	.113	.105	.098	.093	.089	.085	.079	.075	.072	.067
9	.219	.138	.125	.115	.106	.100	.094	.089	.085	.082	.077	.073	.071	.066
8	.197	.127	.116	.107	.100	.094	.090	.086	.082	.079	.075	.072	.069	.065
7	.170	.117	.108	.100	.094	.089	.085	.082	.079	.077	.073	.070	.068	.064
6	.137	.107	.100	.094	.089	.085	.081	.078	.076	.074	.071	.068	.066	.064
5	.105	.098	.092	.087	.083	.080	.077	.075	.073	.071	.068	.066	.065	.063

[Statutory Authority: RCW 51.04.020. 95-06-069, § 296-17-91901, filed 3/1/95, effective 4/10/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-91901, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91901, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91901, filed 8/8/86. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-91901, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-91901, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-91901, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-91901, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-91901, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-91901, filed 1/30/81.]

WAC 296-17-91902 Table III.

RETROSPECTIVE RATING PLAN B
BASIC PREMIUM RATIOS
AND LOSS CONVERSION FACTORS
Effective April 10, 1995

Maximum Premium Ratio: 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.60 1.70 1.80 2.00

Size
Group

63	Basic Premium Ratio	.993	.986	.979	.972	.965	.958	.951	.944	.938	.931	.917	.903	.889	.861
	Loss Conversion Factor	.007	.014	.021	.028	.035	.042	.049	.056	.062	.069	.083	.097	.111	.139
62	Basic Premium Ratio	.992	.985	.977	.970	.962	.954	.947	.939	.931	.924	.909	.893	.878	.848
	Loss Conversion Factor	.008	.015	.023	.030	.038	.046	.053	.061	.069	.076	.091	.107	.122	.152
61	Basic Premium Ratio	.992	.983	.975	.967	.959	.950	.942	.934	.926	.917	.901	.884	.868	.835
	Loss Conversion Factor	.008	.017	.025	.033	.041	.050	.058	.066	.074	.083	.099	.116	.132	.165
60	Basic Premium Ratio	.991	.982	.973	.964	.955	.946	.937	.928	.919	.910	.892	.874	.856	.819
	Loss Conversion Factor	.009	.018	.027	.036	.045	.054	.063	.072	.081	.090	.108	.126	.144	.181
59	Basic Premium Ratio	.990	.980	.971	.961	.951	.941	.931	.921	.912	.902	.882	.862	.843	.803
	Loss Conversion Factor	.010	.020	.029	.039	.049	.059	.069	.079	.088	.098	.118	.138	.157	.197
58	Basic Premium Ratio	.989	.979	.968	.957	.947	.936	.926	.915	.904	.894	.872	.851	.830	.787
	Loss Conversion Factor	.011	.021	.032	.043	.053	.064	.074	.085	.096	.106	.128	.149	.170	.213
57	Basic Premium Ratio	.989	.977	.966	.954	.943	.931	.920	.908	.897	.886	.863	.840	.817	.771
	Loss Conversion Factor	.011	.023	.034	.046	.057	.069	.080	.092	.103	.114	.137	.160	.183	.229
56	Basic Premium Ratio	.988	.976	.963	.951	.939	.927	.914	.902	.890	.878	.853	.829	.805	.756
	Loss Conversion Factor	.012	.024	.037	.049	.061	.073	.086	.098	.110	.122	.147	.171	.195	.244
55	Basic Premium Ratio	.987	.974	.961	.948	.935	.922	.909	.896	.883	.870	.844	.818	.792	.741
	Loss Conversion Factor	.013	.026	.039	.052	.065	.078	.091	.104	.117	.130	.156	.182	.208	.259
54	Basic Premium Ratio	.986	.972	.959	.945	.931	.917	.904	.890	.876	.862	.835	.807	.780	.724
	Loss Conversion Factor	.014	.028	.041	.055	.069	.083	.096	.110	.124	.138	.165	.193	.220	.276
53	Basic Premium Ratio	.985	.971	.956	.941	.927	.912	.898	.883	.868	.854	.824	.795	.766	.707
	Loss Conversion Factor	.015	.029	.044	.059	.073	.088	.102	.117	.132	.146	.176	.205	.234	.293

Workers' Compensation Insurance

296-17-91902

52	Basic Premium Ratio	.984	.969	.953	.938	.922	.907	.891	.876	.860	.845	.814	.783	.752	.690
	Loss Conversion Factor	.016	.031	.047	.062	.078	.093	.109	.124	.140	.155	.186	.217	.248	.310
51	Basic Premium Ratio	.983	.967	.950	.934	.917	.901	.884	.868	.851	.835	.802	.769	.735	.669
	Loss Conversion Factor	.017	.033	.050	.066	.083	.099	.116	.132	.149	.165	.198	.231	.265	.331
50	Basic Premium Ratio	.982	.965	.947	.929	.911	.894	.876	.858	.841	.823	.787	.752	.717	.646
	Loss Conversion Factor	.018	.035	.053	.071	.089	.106	.124	.142	.159	.177	.213	.248	.283	.354
49	Basic Premium Ratio	.981	.962	.943	.924	.905	.886	.867	.848	.829	.810	.772	.734	.696	.621
	Loss Conversion Factor	.019	.038	.057	.076	.095	.114	.133	.152	.171	.190	.228	.266	.304	.379
48	Basic Premium Ratio	.980	.959	.939	.919	.898	.878	.858	.837	.817	.797	.756	.716	.675	.594
	Loss Conversion Factor	.020	.041	.061	.081	.102	.122	.142	.163	.183	.203	.244	.284	.325	.406
47	Basic Premium Ratio	.978	.957	.935	.913	.891	.870	.848	.826	.805	.783	.740	.696	.653	.566
	Loss Conversion Factor	.022	.043	.065	.087	.109	.130	.152	.174	.195	.217	.260	.304	.347	.434
46	Basic Premium Ratio	.977	.954	.931	.908	.885	.862	.839	.816	.793	.770	.724	.677	.631	.539
	Loss Conversion Factor	.023	.046	.069	.092	.115	.138	.161	.184	.207	.230	.276	.323	.369	.461
45	Basic Premium Ratio	.976	.951	.927	.902	.878	.854	.829	.805	.780	.756	.707	.658	.609	.512
	Loss Conversion Factor	.024	.049	.073	.098	.122	.146	.171	.195	.220	.244	.293	.342	.391	.488
44	Basic Premium Ratio	.974	.948	.922	.897	.871	.845	.819	.793	.767	.742	.690	.638	.587	.483
	Loss Conversion Factor	.026	.052	.078	.103	.129	.155	.181	.207	.233	.258	.310	.362	.413	.517
43	Basic Premium Ratio	.973	.945	.918	.891	.863	.836	.809	.781	.754	.727	.672	.617	.562	.453
	Loss Conversion Factor	.027	.055	.082	.109	.137	.164	.191	.219	.246	.273	.328	.383	.438	.547
42	Basic Premium Ratio	.970	.941	.911	.881	.852	.822	.792	.763	.733	.703	.644	.585	.525	.406
	Loss Conversion Factor	.030	.059	.089	.119	.148	.178	.208	.237	.267	.297	.356	.415	.475	.594
41	Basic Premium Ratio	.968	.935	.903	.870	.838	.806	.773	.741	.708	.676	.611	.546	.481	.352
	Loss Conversion Factor	.032	.065	.097	.130	.162	.194	.227	.259	.292	.324	.389	.454	.519	.648
40	Basic Premium Ratio	.965	.929	.894	.859	.823	.788	.753	.718	.682	.647	.576	.506	.435	.294
	Loss Conversion Factor	.035	.071	.106	.141	.177	.212	.247	.282	.318	.353	.424	.494	.565	.706
39	Basic Premium Ratio	.962	.923	.885	.847	.808	.770	.732	.693	.655	.616	.540	.463	.386	.233
	Loss Conversion Factor	.038	.077	.115	.153	.192	.230	.268	.307	.345	.384	.460	.537	.614	.767
38	Basic Premium Ratio	.958	.917	.875	.834	.792	.751	.709	.668	.626	.585	.502	.419	.336	.170
	Loss Conversion Factor	.042	.083	.125	.166	.208	.249	.291	.332	.374	.415	.498	.581	.664	.830
37	Basic Premium Ratio	.955	.910	.865	.820	.776	.731	.686	.641	.596	.551	.461	.371	.282	.102
	Loss Conversion Factor	.045	.090	.135	.180	.224	.269	.314	.359	.404	.449	.539	.629	.718	.898
36	Basic Premium Ratio	.951	.903	.854	.806	.757	.709	.660	.612	.563	.514	.417	.320	.223	.029
	Loss Conversion Factor	.049	.097	.146	.194	.243	.291	.340	.388	.437	.486	.583	.680	.777	.971
35	Basic Premium Ratio	.947	.895	.842	.789	.736	.684	.631	.578	.525	.473	.367	.262	.156	.000
	Loss Conversion Factor	.053	.105	.158	.211	.264	.316	.369	.422	.475	.527	.633	.738	.844	.987
34	Basic Premium Ratio	.943	.886	.829	.771	.714	.657	.600	.543	.486	.428	.314	.200	.085	.000
	Loss Conversion Factor	.057	.114	.171	.229	.286	.343	.400	.457	.514	.572	.686	.800	.915	.969
33	Basic Premium Ratio	.938	.876	.814	.752	.690	.628	.567	.505	.443	.381	.257	.133	.009	.000
	Loss Conversion Factor	.062	.124	.186	.248	.310	.372	.433	.495	.557	.619	.743	.867	.991	.953
32	Basic Premium Ratio	.933	.866	.799	.732	.665	.598	.531	.463	.396	.329	.195	.061	.000	.000
	Loss Conversion Factor	.067	.134	.201	.268	.335	.402	.469	.537	.604	.671	.805	.939	.984	.939
31	Basic Premium Ratio	.927	.854	.781	.707	.634	.561	.488	.415	.342	.268	.122	.000	.000	.000
	Loss Conversion Factor	.073	.146	.219	.293	.366	.439	.512	.585	.658	.732	.878	.994	.965	.925
30	Basic Premium Ratio	.920	.840	.760	.680	.600	.520	.440	.360	.280	.200	.040	.000	.000	.000
	Loss Conversion Factor	.080	.160	.240	.320	.400	.480	.560	.640	.720	.800	.960	.975	.949	.913
29	Basic Premium Ratio	.913	.826	.739	.651	.564	.477	.390	.303	.216	.128	.000	.000	.000	.000
	Loss Conversion Factor	.087	.174	.261	.349	.436	.523	.610	.697	.784	.872	.990	.958	.935	.902
28	Basic Premium Ratio	.904	.807	.711	.615	.519	.422	.326	.230	.134	.037	.000	.000	.000	.000
	Loss Conversion Factor	.096	.193	.289	.385	.481	.578	.674	.770	.866	.963	.969	.940	.918	.887
27	Basic Premium Ratio	.892	.785	.677	.570	.462	.355	.247	.140	.032	.000	.000	.000	.000	.000
	Loss Conversion Factor	.108	.215	.323	.430	.538	.645	.753	.860	.968	.983	.946	.918	.897	.868
26	Basic Premium Ratio	.881	.761	.642	.522	.403	.283	.164	.044	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.119	.239	.358	.478	.597	.717	.836	.956	.983	.960	.925	.899	.879	.851
25	Basic Premium Ratio	.868	.736	.604	.472	.340	.208	.075	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.132	.264	.396	.528	.660	.792	.925	.987	.961	.940	.907	.883	.864	.838
24	Basic Premium Ratio	.852	.705	.557	.409	.261	.114	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.148	.295	.443	.591	.739	.886	.992	.964	.941	.922	.893	.872	.855	.832

23	Basic Premium Ratio	.835	.669	.504	.338	.173	.008	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.165	.331	.496	.662	.827	.992	.969	.944	.924	.907	.881	.862	.848
22	Basic Premium Ratio	.814	.628	.442	.256	.070	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.186	.372	.558	.744	.930	.978	.949	.927	.909	.894	.871	.854	.841
21	Basic Premium Ratio	.790	.579	.369	.159	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.210	.421	.631	.841	.990	.957	.932	.912	.896	.882	.862	.847	.835
20	Basic Premium Ratio	.758	.516	.274	.032	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.242	.484	.726	.968	.966	.936	.913	.895	.881	.869	.851	.837	.827
19	Basic Premium Ratio	.720	.439	.159	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.280	.561	.841	.979	.942	.915	.894	.878	.865	.854	.838	.826	.817
18	Basic Premium Ratio	.672	.344	.016	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.328	.656	.984	.954	.920	.896	.877	.863	.851	.842	.827	.817	.810
17	Basic Premium Ratio	.617	.234	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.383	.766	.977	.932	.902	.879	.863	.850	.839	.831	.819	.810	.803
16	Basic Premium Ratio	.550	.100	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.450	.900	.953	.913	.885	.865	.851	.839	.830	.823	.812	.804	.798
15	Basic Premium Ratio	.477	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.523	.992	.932	.896	.872	.854	.841	.831	.822	.816	.806	.799	.794
14	Basic Premium Ratio	.414	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.586	.973	.912	.881	.861	.846	.834	.825	.818	.812	.804	.797	.793
13	Basic Premium Ratio	.344	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.656	.953	.889	.867	.851	.838	.828	.821	.814	.809	.801	.796	.791
12	Basic Premium Ratio	.256	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.744	.931	.874	.856	.842	.831	.823	.816	.810	.806	.799	.794	.790
11	Basic Premium Ratio	.159	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.841	.906	.860	.846	.834	.825	.818	.812	.807	.803	.796	.792	.788
10	Basic Premium Ratio	.042	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.958	.879	.848	.836	.827	.819	.813	.807	.803	.800	.794	.790	.787
9	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.982	.850	.838	.828	.820	.813	.808	.803	.800	.797	.792	.788	.786
8	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.952	.838	.828	.820	.813	.808	.803	.800	.796	.794	.790	.787	.784
7	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.917	.828	.820	.813	.807	.803	.799	.796	.793	.791	.788	.785	.783
6	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.876	.818	.812	.806	.802	.798	.795	.792	.790	.788	.785	.783	.782
5	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.826	.809	.804	.800	.797	.794	.791	.789	.787	.786	.783	.782	.780

[Statutory Authority: RCW 51.04.020, 95-06-069, § 296-17-91902, filed 3/1/95, effective 4/10/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 88-24-010 (Order 88-26), § 296-17-91902, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91902, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91902, filed 8/8/86. Statutory Authority: RCW 51.16.035, 86-06-018 (Order 86-18), § 296-17-91902, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-91902, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-91902, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-91902, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-91902, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-91902, filed 1/30/81.]

WAC 296-17-91903 Table IV.

RETROSPECTIVE RATING PLAN A1
 MINIMUM PREMIUM RATIOS
 BASIC PREMIUM RATIO = .058
 LOSS CONVERSION FACTOR = .729
 Effective April 10, 1995

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group														
63	.987	.975	.963	.951	.940	.928	.918	.907	.897	.887	.868	.850	.833	.801
62	.987	.974	.961	.949	.938	.926	.915	.904	.894	.884	.864	.845	.828	.795
61	.986	.973	.960	.948	.936	.924	.912	.901	.890	.880	.860	.841	.823	.789
60	.986	.972	.959	.946	.933	.921	.909	.898	.887	.876	.855	.836	.817	.783
59	.985	.971	.958	.944	.931	.919	.907	.895	.883	.872	.851	.831	.812	.777
58	.985	.970	.956	.943	.929	.917	.904	.892	.880	.869	.847	.826	.807	.771

Workers' Compensation Insurance

296-17-91903

57	.985	.970	.955	.941	.927	.914	.901	.889	.877	.865	.843	.822	.802	.765
56	.984	.969	.954	.939	.925	.912	.899	.886	.874	.862	.839	.818	.797	.760
55	.984	.968	.953	.938	.924	.910	.896	.884	.871	.859	.836	.814	.793	.756
54	.983	.967	.951	.936	.922	.908	.894	.881	.868	.856	.832	.810	.790	.752
53	.983	.966	.950	.935	.920	.906	.892	.878	.866	.853	.829	.807	.786	.748
52	.982	.965	.949	.933	.918	.904	.890	.876	.863	.850	.826	.804	.783	.744
51	.982	.965	.948	.932	.917	.902	.887	.874	.860	.847	.823	.800	.779	.740
50	.982	.964	.947	.930	.915	.899	.885	.871	.857	.844	.819	.796	.775	.735
49	.981	.963	.946	.929	.913	.897	.882	.868	.854	.841	.816	.792	.770	.731
48	.981	.962	.945	.927	.911	.895	.880	.866	.852	.838	.812	.789	.767	.727
47	.980	.962	.944	.926	.910	.894	.878	.864	.849	.836	.810	.786	.764	.723
46	.980	.961	.943	.925	.909	.893	.877	.863	.848	.835	.809	.785	.763	.723
45	.980	.961	.942	.925	.908	.892	.877	.862	.848	.834	.808	.784	.762	.722
44	.980	.960	.942	.924	.907	.891	.876	.861	.847	.833	.808	.784	.762	.722
43	.980	.960	.941	.924	.907	.891	.875	.861	.846	.833	.807	.784	.762	.722
42	.979	.959	.940	.922	.905	.888	.872	.857	.843	.829	.803	.779	.757	.717
41	.978	.958	.938	.920	.902	.885	.869	.853	.839	.825	.798	.774	.751	.710
40	.978	.957	.937	.918	.899	.882	.866	.850	.835	.820	.793	.768	.745	.704
39	.977	.956	.935	.916	.897	.879	.863	.846	.831	.816	.789	.764	.741	.699
38	.977	.955	.934	.914	.895	.877	.860	.843	.828	.813	.785	.760	.736	.694
37	.976	.954	.933	.912	.893	.875	.857	.841	.825	.810	.782	.756	.732	.690
36	.976	.953	.932	.911	.891	.873	.855	.838	.822	.807	.779	.753	.729	.686
35	.976	.953	.931	.910	.890	.871	.854	.837	.821	.805	.777	.751	.727	.684
34	.975	.952	.930	.909	.889	.870	.852	.835	.819	.804	.775	.749	.725	.683
33	.975	.951	.929	.908	.888	.869	.851	.834	.818	.802	.774	.748	.724	.682
32	.975	.951	.929	.907	.887	.868	.850	.833	.817	.802	.773	.747	.724	.682
31	.975	.951	.928	.907	.886	.867	.849	.832	.816	.801	.773	.747	.724	.682
30	.974	.950	.927	.906	.886	.867	.849	.832	.816	.801	.773	.747	.724	.682
29	.974	.950	.927	.906	.886	.867	.849	.832	.816	.801	.773	.747	.724	.682
28	.974	.949	.926	.904	.883	.864	.846	.828	.812	.797	.769	.744	.721	.682
27	.973	.947	.922	.899	.877	.857	.837	.819	.802	.785	.754	.727	.701	.657
26	.972	.945	.919	.895	.872	.851	.830	.811	.792	.775	.742	.712	.685	.636
25	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
24	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
23	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
22	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
21	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
20	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
19	.970	.941	.915	.891	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
18	.969	.940	.912	.887	.864	.843	.823	.804	.785	.766	.732	.701	.672	.620
17	.968	.938	.911	.885	.862	.840	.820	.801	.784	.766	.732	.701	.672	.620
16	.968	.937	.910	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
15	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
14	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
13	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
12	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
11	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
10	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
9	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
8	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
7	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
6	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
5	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620

[Statutory Authority: RCW 51.04.020, 95-06-069, § 296-17-91903, filed 3/1/95, effective 4/10/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 88-24-010 (Order 88-26), § 296-17-91903, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91903, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91903, filed 8/8/86. Statutory Authority: RCW 51.16.035, 86-06-018 (Order 86-18), § 296-17-91903, filed 2/25/86.]

WAC 296-17-91904 Table V.

RETROSPECTIVE RATING PLAN A2 MINIMUM PREMIUM RATIOS AND BASIC PREMIUM RATIOS LOSS CONVERSION FACTOR = .729 Effective April 10, 1995

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group														
63 Basic Premium Ratio	.483	.457	.439	.425	.412	.402	.392	.383	.375	.368	.354	.342	.330	.311
Minimum Premium Ratio	.979	.960	.943	.927	.912	.898	.884	.871	.859	.846	.823	.802	.782	.745

62	Basic Premium Ratio	.480	.454	.436	.421	.408	.397	.387	.378	.370	.362	.348	.335	.324	.304
	Minimum Premium Ratio	.978	.959	.941	.925	.909	.894	.880	.867	.854	.841	.818	.796	.775	.738
61	Basic Premium Ratio	.478	.451	.432	.416	.403	.392	.382	.373	.364	.356	.342	.329	.318	.297
	Minimum Premium Ratio	.977	.957	.939	.922	.906	.891	.876	.862	.849	.836	.811	.789	.768	.730
60	Basic Premium Ratio	.475	.448	.428	.412	.399	.387	.377	.367	.358	.350	.336	.323	.311	.290
	Minimum Premium Ratio	.976	.955	.936	.919	.902	.886	.871	.857	.843	.830	.805	.781	.760	.721
59	Basic Premium Ratio	.473	.445	.424	.408	.394	.382	.371	.362	.353	.344	.329	.316	.304	.283
	Minimum Premium Ratio	.975	.954	.934	.916	.898	.882	.867	.852	.837	.824	.798	.774	.752	.713
58	Basic Premium Ratio	.471	.442	.421	.404	.389	.377	.366	.356	.347	.338	.323	.310	.298	.277
	Minimum Premium Ratio	.974	.952	.931	.912	.895	.878	.862	.847	.832	.818	.792	.767	.745	.704
57	Basic Premium Ratio	.468	.438	.417	.399	.385	.372	.361	.351	.341	.333	.317	.303	.291	.270
	Minimum Premium Ratio	.973	.950	.929	.909	.891	.874	.857	.842	.827	.813	.786	.761	.738	.697
56	Basic Premium Ratio	.465	.434	.412	.395	.380	.367	.355	.345	.335	.326	.311	.297	.285	.263
	Minimum Premium Ratio	.972	.948	.926	.906	.887	.870	.853	.837	.822	.807	.780	.755	.731	.690
55	Basic Premium Ratio	.462	.430	.408	.390	.374	.361	.349	.339	.329	.320	.304	.290	.278	.257
	Minimum Premium Ratio	.971	.946	.924	.903	.884	.866	.849	.832	.817	.802	.774	.749	.725	.683
54	Basic Premium Ratio	.458	.426	.403	.384	.369	.355	.343	.333	.323	.314	.298	.284	.271	.250
	Minimum Premium Ratio	.970	.945	.922	.900	.880	.862	.844	.827	.812	.797	.768	.743	.719	.677
53	Basic Premium Ratio	.455	.422	.398	.379	.363	.350	.337	.327	.317	.307	.291	.277	.265	.244
	Minimum Premium Ratio	.969	.943	.919	.897	.877	.858	.840	.823	.807	.792	.763	.737	.713	.671
52	Basic Premium Ratio	.451	.417	.393	.374	.358	.344	.332	.320	.310	.301	.285	.271	.258	.238
	Minimum Premium Ratio	.968	.941	.917	.895	.874	.854	.836	.819	.803	.787	.758	.732	.709	.666
51	Basic Premium Ratio	.447	.413	.388	.369	.352	.338	.325	.314	.304	.295	.278	.264	.252	.232
	Minimum Premium Ratio	.967	.939	.914	.891	.870	.851	.832	.815	.798	.782	.753	.727	.703	.660
50	Basic Premium Ratio	.443	.408	.383	.363	.346	.332	.319	.308	.298	.288	.272	.258	.245	.225
	Minimum Premium Ratio	.966	.937	.912	.888	.867	.846	.828	.810	.793	.777	.747	.721	.697	.654
49	Basic Premium Ratio	.440	.403	.378	.357	.340	.326	.313	.301	.291	.282	.265	.251	.239	.219
	Minimum Premium Ratio	.965	.935	.909	.885	.863	.842	.823	.805	.788	.772	.742	.715	.690	.647
48	Basic Premium Ratio	.436	.399	.372	.352	.334	.320	.307	.295	.285	.275	.259	.245	.232	.213
	Minimum Premium Ratio	.964	.933	.907	.882	.860	.839	.819	.801	.783	.767	.737	.710	.685	.641
47	Basic Premium Ratio	.431	.394	.367	.346	.328	.313	.300	.289	.278	.269	.252	.238	.226	.207
	Minimum Premium Ratio	.962	.931	.904	.879	.856	.835	.816	.797	.780	.763	.733	.706	.681	.637
46	Basic Premium Ratio	.427	.388	.361	.339	.321	.306	.293	.282	.271	.262	.246	.232	.220	.201
	Minimum Premium Ratio	.961	.929	.901	.876	.853	.832	.812	.793	.776	.760	.729	.702	.678	.635
45	Basic Premium Ratio	.423	.383	.354	.333	.315	.300	.286	.275	.265	.255	.239	.226	.215	.196
	Minimum Premium Ratio	.960	.927	.899	.873	.850	.829	.809	.790	.773	.757	.727	.700	.675	.633
44	Basic Premium Ratio	.418	.377	.348	.326	.308	.293	.280	.268	.258	.249	.233	.220	.209	.191
	Minimum Premium Ratio	.958	.925	.897	.871	.848	.826	.806	.788	.771	.754	.725	.698	.674	.631
43	Basic Premium Ratio	.413	.371	.342	.319	.301	.286	.273	.262	.252	.243	.227	.215	.204	.186
	Minimum Premium Ratio	.957	.924	.895	.869	.846	.824	.804	.786	.768	.752	.723	.696	.672	.630
42	Basic Premium Ratio	.408	.365	.335	.313	.294	.279	.266	.255	.245	.236	.221	.208	.197	.180
	Minimum Premium Ratio	.956	.921	.892	.865	.842	.820	.799	.781	.763	.747	.716	.690	.666	.623
41	Basic Premium Ratio	.403	.359	.329	.306	.288	.272	.259	.248	.238	.229	.213	.201	.190	.173
	Minimum Premium Ratio	.954	.919	.889	.862	.837	.815	.794	.775	.757	.740	.710	.683	.659	.616
40	Basic Premium Ratio	.398	.353	.322	.299	.281	.265	.252	.241	.231	.222	.207	.194	.184	.167
	Minimum Premium Ratio	.953	.917	.886	.858	.833	.810	.789	.770	.752	.735	.704	.677	.651	.609
39	Basic Premium Ratio	.392	.347	.316	.292	.274	.258	.245	.234	.224	.215	.200	.188	.177	.161
	Minimum Premium Ratio	.951	.914	.883	.855	.829	.806	.785	.765	.747	.730	.699	.671	.646	.603
38	Basic Premium Ratio	.386	.340	.309	.286	.267	.252	.238	.227	.217	.209	.194	.182	.171	.155
	Minimum Premium Ratio	.950	.913	.880	.852	.826	.802	.781	.761	.743	.725	.694	.666	.641	.598
37	Basic Premium Ratio	.380	.333	.302	.279	.260	.245	.232	.221	.211	.202	.188	.176	.166	.150
	Minimum Premium Ratio	.949	.911	.878	.849	.823	.800	.778	.757	.739	.722	.690	.661	.636	.593
36	Basic Premium Ratio	.373	.326	.295	.272	.253	.238	.225	.214	.204	.196	.181	.170	.160	.145
	Minimum Premium Ratio	.948	.909	.876	.847	.821	.797	.775	.755	.736	.718	.687	.658	.634	.590
35	Basic Premium Ratio	.366	.318	.287	.264	.246	.230	.218	.207	.197	.189	.175	.164	.154	.140
	Minimum Premium Ratio	.947	.908	.874	.845	.818	.795	.773	.752	.734	.716	.685	.656	.632	.588
34	Basic Premium Ratio	.358	.310	.279	.256	.238	.223	.211	.200	.191	.183	.169	.158	.149	.135
	Minimum Premium Ratio	.946	.906	.873	.844	.817	.793	.771	.751	.732	.714	.683	.655	.630	.587

Workers' Compensation Insurance

296-17-91904

33	Basic Premium Ratio	.349	.302	.271	.249	.231	.216	.204	.194	.184	.177	.163	.153	.144	.130
	Minimum Premium Ratio	.945	.906	.872	.842	.816	.792	.770	.750	.732	.714	.683	.655	.630	.588
32	Basic Premium Ratio	.341	.294	.263	.241	.224	.209	.197	.187	.178	.171	.158	.148	.139	.126
	Minimum Premium Ratio	.945	.905	.872	.842	.816	.792	.770	.750	.732	.714	.683	.655	.631	.589
31	Basic Premium Ratio	.333	.285	.255	.233	.216	.202	.190	.180	.172	.164	.152	.142	.134	.122
	Minimum Premium Ratio	.944	.904	.870	.841	.814	.790	.769	.749	.730	.714	.683	.656	.633	.591
30	Basic Premium Ratio	.324	.277	.247	.225	.208	.195	.183	.174	.166	.159	.147	.137	.130	.118
	Minimum Premium Ratio	.943	.902	.869	.840	.814	.790	.769	.748	.730	.713	.683	.658	.634	.595
29	Basic Premium Ratio	.315	.268	.239	.218	.201	.188	.177	.168	.160	.153	.142	.133	.126	.115
	Minimum Premium Ratio	.942	.902	.868	.839	.813	.790	.769	.749	.731	.715	.685	.659	.637	.599
28	Basic Premium Ratio	.306	.260	.231	.210	.194	.181	.170	.161	.153	.147	.136	.127	.120	.109
	Minimum Premium Ratio	.942	.901	.867	.838	.811	.788	.766	.747	.729	.711	.681	.655	.632	.593
27	Basic Premium Ratio	.298	.252	.223	.202	.186	.173	.163	.153	.146	.139	.128	.119	.112	.101
	Minimum Premium Ratio	.940	.898	.864	.833	.806	.781	.758	.738	.718	.700	.668	.640	.614	.571
26	Basic Premium Ratio	.290	.244	.216	.195	.179	.166	.155	.146	.138	.132	.121	.112	.105	.094
	Minimum Premium Ratio	.939	.896	.860	.829	.801	.775	.752	.731	.711	.691	.657	.627	.599	.553
25	Basic Premium Ratio	.281	.236	.208	.188	.172	.159	.148	.139	.132	.125	.114	.105	.098	.088
	Minimum Premium Ratio	.938	.895	.858	.826	.797	.771	.747	.725	.704	.685	.650	.619	.592	.542
24	Basic Premium Ratio	.270	.226	.199	.179	.164	.152	.142	.133	.126	.120	.110	.102	.095	.086
	Minimum Premium Ratio	.938	.894	.858	.827	.798	.773	.749	.729	.708	.689	.655	.625	.600	.551
23	Basic Premium Ratio	.259	.216	.190	.171	.156	.145	.136	.128	.121	.115	.106	.098	.093	.084
	Minimum Premium Ratio	.938	.895	.860	.829	.802	.777	.753	.733	.714	.697	.663	.636	.608	.564
22	Basic Premium Ratio	.248	.207	.181	.163	.150	.139	.130	.123	.116	.111	.102	.095	.090	.082
	Minimum Premium Ratio	.938	.896	.862	.832	.805	.781	.760	.739	.722	.704	.674	.648	.622	.580
21	Basic Premium Ratio	.236	.197	.173	.156	.143	.133	.125	.118	.112	.107	.099	.093	.088	.080
	Minimum Premium Ratio	.940	.899	.865	.836	.811	.787	.766	.747	.730	.714	.685	.659	.636	.599
20	Basic Premium Ratio	.226	.188	.165	.149	.136	.126	.119	.112	.107	.102	.094	.089	.084	.077
	Minimum Premium Ratio	.939	.898	.865	.835	.810	.788	.766	.748	.730	.715	.689	.662	.642	.607
19	Basic Premium Ratio	.218	.180	.156	.140	.128	.119	.111	.105	.100	.096	.089	.084	.080	.074
	Minimum Premium Ratio	.937	.894	.860	.830	.804	.781	.761	.742	.724	.708	.680	.655	.633	.597
18	Basic Premium Ratio	.208	.171	.148	.133	.121	.112	.105	.099	.095	.091	.084	.080	.076	.071
	Minimum Premium Ratio	.935	.892	.857	.826	.800	.777	.756	.737	.718	.703	.677	.651	.631	.594
17	Basic Premium Ratio	.199	.162	.140	.125	.115	.106	.099	.094	.090	.086	.081	.076	.073	.069
	Minimum Premium Ratio	.934	.891	.856	.826	.798	.775	.755	.736	.717	.703	.673	.653	.631	.592
16	Basic Premium Ratio	.189	.154	.133	.119	.109	.101	.095	.090	.086	.082	.077	.073	.071	.067
	Minimum Premium Ratio	.934	.890	.855	.825	.798	.775	.754	.736	.719	.706	.679	.658	.633	.598
15	Basic Premium Ratio	.181	.146	.126	.113	.103	.096	.090	.086	.082	.079	.075	.071	.069	.065
	Minimum Premium Ratio	.933	.889	.855	.826	.801	.778	.759	.739	.724	.710	.682	.663	.641	.613
14	Basic Premium Ratio	.176	.139	.119	.108	.100	.093	.088	.084	.081	.078	.074	.070	.068	.065
	Minimum Premium Ratio	.924	.878	.850	.821	.796	.775	.755	.737	.720	.706	.679	.663	.642	.608
13	Basic Premium Ratio	.170	.131	.113	.103	.096	.090	.085	.082	.079	.076	.072	.070	.067	.064
	Minimum Premium Ratio	.915	.868	.844	.818	.793	.772	.754	.735	.719	.706	.682	.656	.643	.612
12	Basic Premium Ratio	.164	.123	.107	.099	.092	.087	.083	.080	.077	.075	.071	.069	.067	.064
	Minimum Premium Ratio	.904	.860	.839	.812	.791	.770	.751	.732	.718	.702	.680	.655	.637	.606
11	Basic Premium Ratio	.156	.113	.102	.094	.089	.084	.081	.078	.075	.073	.070	.068	.066	.063
	Minimum Premium Ratio	.892	.859	.834	.811	.786	.768	.747	.730	.718	.704	.678	.655	.638	.612
10	Basic Premium Ratio	.148	.104	.097	.090	.086	.082	.078	.076	.074	.072	.069	.067	.065	.063
	Minimum Premium Ratio	.876	.858	.829	.807	.782	.762	.748	.728	.712	.699	.676	.654	.640	.605
9	Basic Premium Ratio	.139	.098	.092	.087	.082	.079	.076	.074	.072	.070	.068	.066	.065	.062
	Minimum Premium Ratio	.856	.853	.825	.800	.782	.761	.744	.727	.712	.702	.674	.654	.631	.612
8	Basic Premium Ratio	.106	.093	.087	.083	.079	.076	.074	.072	.070	.069	.067	.065	.064	.062
	Minimum Premium Ratio	.855	.846	.823	.798	.779	.761	.741	.725	.713	.697	.671	.654	.633	.604
7	Basic Premium Ratio	.097	.088	.083	.079	.076	.074	.072	.070	.069	.068	.066	.064	.063	.061
	Minimum Premium Ratio	.855	.840	.818	.797	.777	.756	.738	.725	.707	.691	.668	.655	.636	.613
6	Basic Premium Ratio	.089	.083	.079	.076	.074	.072	.070	.068	.067	.066	.065	.063	.062	.061
	Minimum Premium Ratio	.855	.836	.814	.792	.768	.749	.735	.725	.709	.696	.664	.656	.640	.602
5	Basic Premium Ratio	.082	.078	.075	.073	.071	.069	.068	.067	.066	.065	.063	.062	.062	.061
	Minimum Premium Ratio	.855	.833	.811	.787	.767	.752	.732	.714	.700	.689	.677	.658	.624	.586

[Statutory Authority: RCW 51.04.020, 95-06-069, § 296-17-91904, filed 3/1/95, effective 4/10/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 88-24-010 (Order 88-26), § 296-17-91904, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91904, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91904, filed 8/8/86. Statutory Authority: RCW 51.16.035, 86-06-018 (Order 86-18), § 296-17-91904, filed 2/25/86.]

WAC 296-17-91905 Table VI.

RETROSPECTIVE RATING PLAN A3
MINIMUM PREMIUM RATIOS
AND BASIC PREMIUM RATIOS
LOSS CONVERSION FACTOR = .729
Effective April 10, 1995

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group															
63	Basic Premium Ratio	.818	.762	.722	.692	.666	.642	.622	.603	.586	.571	.543	.517	.495	.458
	Minimum Premium Ratio	.947	.916	.892	.871	.853	.837	.822	.808	.795	.782	.759	.738	.718	.682
62	Basic Premium Ratio	.814	.760	.719	.687	.659	.636	.616	.596	.578	.562	.534	.509	.486	.448
	Minimum Premium Ratio	.945	.912	.887	.866	.848	.831	.815	.801	.788	.775	.751	.729	.709	.673
61	Basic Premium Ratio	.813	.754	.713	.680	.652	.628	.606	.587	.570	.553	.524	.497	.475	.437
	Minimum Premium Ratio	.942	.909	.883	.861	.842	.825	.809	.794	.780	.767	.743	.721	.700	.663
60	Basic Premium Ratio	.811	.749	.705	.672	.644	.618	.597	.577	.558	.543	.513	.486	.464	.425
	Minimum Premium Ratio	.939	.905	.879	.856	.836	.819	.802	.787	.773	.759	.734	.712	.690	.653
59	Basic Premium Ratio	.805	.744	.699	.664	.634	.608	.586	.567	.549	.532	.501	.475	.452	.413
	Minimum Premium Ratio	.937	.901	.874	.851	.831	.813	.796	.780	.765	.751	.726	.703	.681	.643
58	Basic Premium Ratio	.802	.737	.691	.655	.626	.599	.577	.557	.538	.521	.490	.464	.441	.403
	Minimum Premium Ratio	.934	.898	.870	.846	.825	.807	.789	.773	.758	.744	.718	.694	.672	.633
57	Basic Premium Ratio	.796	.731	.685	.647	.618	.591	.568	.547	.528	.511	.480	.454	.431	.392
	Minimum Premium Ratio	.932	.894	.865	.841	.819	.800	.782	.766	.751	.736	.710	.685	.663	.624
56	Basic Premium Ratio	.794	.725	.678	.640	.609	.581	.558	.537	.518	.501	.470	.443	.421	.382
	Minimum Premium Ratio	.928	.890	.860	.835	.813	.794	.776	.759	.743	.728	.701	.677	.654	.614
55	Basic Premium Ratio	.790	.721	.671	.632	.601	.573	.550	.527	.509	.490	.460	.433	.411	.371
	Minimum Premium Ratio	.925	.885	.855	.830	.807	.787	.768	.752	.735	.721	.693	.668	.645	.606
54	Basic Premium Ratio	.787	.714	.666	.626	.592	.565	.541	.518	.499	.481	.450	.423	.400	.363
	Minimum Premium Ratio	.921	.881	.849	.823	.801	.780	.761	.744	.728	.713	.685	.660	.637	.597
53	Basic Premium Ratio	.784	.709	.659	.617	.585	.555	.532	.509	.489	.472	.440	.414	.391	.353
	Minimum Premium Ratio	.917	.876	.844	.818	.794	.774	.754	.737	.721	.705	.677	.652	.629	.589
52	Basic Premium Ratio	.780	.704	.651	.610	.577	.548	.522	.501	.481	.463	.431	.405	.382	.345
	Minimum Premium Ratio	.913	.871	.839	.812	.788	.767	.748	.729	.713	.697	.669	.644	.621	.581
51	Basic Premium Ratio	.775	.698	.644	.602	.567	.539	.514	.491	.471	.454	.422	.396	.372	.336
	Minimum Premium Ratio	.909	.866	.833	.806	.782	.760	.740	.722	.705	.689	.661	.635	.613	.573
50	Basic Premium Ratio	.769	.690	.634	.593	.557	.529	.502	.480	.460	.442	.411	.384	.362	.325
	Minimum Premium Ratio	.905	.861	.828	.799	.775	.752	.733	.714	.697	.681	.652	.627	.604	.564
49	Basic Premium Ratio	.763	.682	.626	.583	.548	.519	.493	.470	.450	.432	.400	.374	.352	.316
	Minimum Premium Ratio	.901	.856	.822	.793	.768	.745	.725	.706	.689	.673	.644	.618	.595	.555
48	Basic Premium Ratio	.756	.674	.617	.574	.538	.509	.482	.460	.439	.422	.390	.365	.342	.307
	Minimum Premium Ratio	.897	.851	.816	.786	.761	.738	.718	.699	.682	.665	.636	.610	.587	.547
47	Basic Premium Ratio	.750	.665	.607	.564	.528	.498	.472	.449	.429	.411	.381	.355	.333	.298
	Minimum Premium Ratio	.892	.846	.810	.780	.754	.731	.710	.692	.674	.658	.628	.602	.579	.539
46	Basic Premium Ratio	.741	.654	.596	.552	.516	.485	.460	.437	.418	.400	.370	.345	.323	.289
	Minimum Premium Ratio	.888	.840	.803	.773	.747	.724	.703	.684	.666	.650	.621	.596	.573	.534
45	Basic Premium Ratio	.731	.643	.585	.540	.503	.473	.448	.426	.406	.389	.360	.335	.315	.282
	Minimum Premium Ratio	.884	.834	.796	.766	.740	.717	.696	.677	.660	.643	.614	.589	.567	.528
44	Basic Premium Ratio	.722	.633	.573	.528	.493	.463	.437	.415	.396	.379	.350	.326	.306	.274
	Minimum Premium Ratio	.879	.828	.790	.759	.732	.709	.689	.670	.653	.637	.608	.583	.561	.523
43	Basic Premium Ratio	.712	.622	.562	.517	.481	.451	.426	.405	.386	.370	.341	.318	.298	.267
	Minimum Premium Ratio	.874	.822	.783	.752	.726	.703	.682	.663	.646	.630	.602	.578	.556	.518
42	Basic Premium Ratio	.703	.612	.551	.506	.470	.440	.415	.394	.375	.358	.330	.307	.288	.257
	Minimum Premium Ratio	.869	.815	.776	.745	.718	.694	.673	.654	.637	.621	.593	.568	.547	.509

Workers' Compensation Insurance

296-17-91905

41	Basic Premium Ratio	.696	.602	.541	.495	.458	.429	.403	.382	.363	.347	.319	.296	.277	.247
	Minimum Premium Ratio	.863	.809	.769	.737	.710	.686	.665	.645	.628	.612	.583	.559	.537	.499
40	Basic Premium Ratio	.686	.592	.530	.484	.448	.418	.392	.371	.352	.336	.308	.286	.267	.237
	Minimum Premium Ratio	.858	.802	.762	.729	.701	.677	.656	.637	.619	.603	.574	.549	.527	.490
39	Basic Premium Ratio	.677	.581	.520	.473	.437	.407	.382	.360	.342	.325	.298	.275	.257	.228
	Minimum Premium Ratio	.852	.796	.754	.721	.693	.669	.648	.628	.610	.594	.566	.541	.519	.482
38	Basic Premium Ratio	.668	.571	.509	.463	.426	.396	.372	.350	.332	.315	.288	.266	.248	.220
	Minimum Premium Ratio	.846	.789	.747	.714	.686	.661	.639	.620	.602	.586	.557	.533	.510	.473
37	Basic Premium Ratio	.659	.562	.499	.453	.416	.387	.362	.340	.322	.306	.279	.257	.240	.212
	Minimum Premium Ratio	.839	.781	.740	.706	.678	.653	.631	.612	.594	.578	.550	.525	.503	.466
36	Basic Premium Ratio	.649	.551	.488	.442	.405	.376	.351	.330	.312	.297	.270	.249	.231	.204
	Minimum Premium Ratio	.832	.774	.732	.698	.670	.645	.624	.604	.586	.570	.542	.517	.496	.459
35	Basic Premium Ratio	.635	.538	.475	.429	.393	.365	.340	.320	.302	.286	.260	.240	.223	.196
	Minimum Premium Ratio	.825	.766	.724	.690	.662	.637	.616	.596	.579	.563	.535	.510	.489	.453
34	Basic Premium Ratio	.623	.525	.463	.418	.382	.354	.330	.309	.292	.277	.252	.231	.215	.189
	Minimum Premium Ratio	.816	.757	.715	.682	.654	.629	.608	.589	.571	.556	.528	.504	.483	.447
33	Basic Premium Ratio	.610	.513	.451	.406	.371	.343	.320	.300	.283	.268	.244	.224	.208	.183
	Minimum Premium Ratio	.808	.749	.707	.674	.646	.622	.600	.582	.564	.549	.521	.498	.477	.442
32	Basic Premium Ratio	.597	.501	.440	.395	.361	.334	.311	.291	.274	.260	.236	.217	.201	.177
	Minimum Premium Ratio	.799	.740	.699	.666	.638	.614	.593	.575	.558	.543	.515	.492	.472	.438
31	Basic Premium Ratio	.582	.486	.425	.382	.348	.321	.299	.280	.264	.250	.226	.208	.193	.171
	Minimum Premium Ratio	.791	.732	.690	.658	.630	.606	.586	.567	.551	.536	.510	.487	.467	.434
30	Basic Premium Ratio	.567	.471	.412	.369	.336	.309	.288	.269	.254	.240	.218	.201	.187	.165
	Minimum Premium Ratio	.782	.723	.681	.649	.622	.599	.579	.561	.545	.530	.504	.482	.463	.430
29	Basic Premium Ratio	.551	.457	.398	.356	.324	.299	.277	.260	.245	.232	.210	.194	.180	.160
	Minimum Premium Ratio	.773	.714	.673	.642	.615	.592	.572	.555	.539	.524	.499	.477	.459	.427
28	Basic Premium Ratio	.537	.444	.386	.344	.313	.287	.266	.249	.234	.221	.200	.184	.171	.151
	Minimum Premium Ratio	.764	.705	.665	.633	.606	.584	.564	.546	.530	.516	.491	.470	.451	.421
27	Basic Premium Ratio	.524	.431	.373	.332	.300	.275	.254	.236	.221	.208	.187	.170	.157	.136
	Minimum Premium Ratio	.755	.697	.655	.623	.596	.573	.552	.534	.518	.502	.476	.453	.433	.400
26	Basic Premium Ratio	.510	.418	.361	.320	.288	.263	.242	.224	.209	.196	.175	.158	.145	.124
	Minimum Premium Ratio	.747	.688	.646	.613	.586	.562	.541	.523	.505	.490	.463	.439	.418	.383
25	Basic Premium Ratio	.497	.405	.348	.307	.276	.251	.230	.213	.198	.185	.164	.147	.134	.114
	Minimum Premium Ratio	.738	.679	.638	.605	.577	.553	.531	.512	.495	.479	.451	.427	.405	.369
24	Basic Premium Ratio	.476	.386	.331	.292	.262	.238	.218	.202	.188	.176	.157	.141	.129	.111
	Minimum Premium Ratio	.727	.669	.628	.596	.569	.546	.525	.506	.490	.474	.447	.423	.402	.367
23	Basic Premium Ratio	.454	.368	.315	.277	.249	.226	.208	.192	.179	.168	.150	.136	.124	.107
	Minimum Premium Ratio	.716	.659	.619	.588	.561	.539	.519	.501	.485	.469	.443	.420	.400	.365
22	Basic Premium Ratio	.434	.351	.300	.264	.237	.216	.198	.184	.172	.161	.144	.131	.120	.104
	Minimum Premium Ratio	.704	.649	.611	.580	.555	.533	.513	.496	.480	.465	.439	.417	.397	.363
21	Basic Premium Ratio	.414	.335	.286	.252	.226	.206	.190	.176	.165	.155	.139	.126	.117	.102
	Minimum Premium Ratio	.693	.640	.603	.573	.548	.527	.508	.491	.476	.461	.436	.414	.395	.361
20	Basic Premium Ratio	.394	.318	.271	.238	.214	.194	.178	.166	.155	.145	.130	.119	.110	.096
	Minimum Premium Ratio	.683	.631	.595	.566	.541	.520	.502	.485	.470	.456	.431	.410	.391	.358
19	Basic Premium Ratio	.377	.301	.254	.222	.198	.179	.164	.152	.142	.133	.120	.109	.101	.089
	Minimum Premium Ratio	.674	.621	.585	.557	.533	.513	.494	.478	.464	.450	.426	.405	.387	.355
18	Basic Premium Ratio	.358	.283	.238	.207	.184	.166	.152	.140	.131	.123	.110	.101	.094	.083
	Minimum Premium Ratio	.664	.612	.575	.547	.524	.505	.488	.472	.458	.445	.421	.401	.383	.352
17	Basic Premium Ratio	.339	.266	.222	.192	.171	.154	.140	.130	.121	.114	.103	.094	.088	.079
	Minimum Premium Ratio	.654	.602	.567	.539	.517	.497	.480	.466	.453	.440	.418	.398	.380	.350
16	Basic Premium Ratio	.320	.249	.208	.179	.159	.143	.131	.121	.113	.106	.096	.088	.083	.075
	Minimum Premium Ratio	.644	.593	.559	.532	.510	.491	.475	.461	.448	.436	.414	.395	.378	.348
15	Basic Premium Ratio	.303	.234	.194	.168	.148	.134	.122	.113	.106	.100	.091	.084	.079	.072
	Minimum Premium Ratio	.635	.586	.552	.526	.504	.486	.470	.457	.445	.433	.412	.393	.376	.346
14	Basic Premium Ratio	.293	.220	.180	.157	.141	.128	.117	.109	.103	.097	.089	.082	.078	.071
	Minimum Premium Ratio	.630	.579	.545	.521	.501	.483	.468	.455	.443	.432	.411	.392	.375	.346
13	Basic Premium Ratio	.281	.204	.167	.148	.133	.122	.112	.105	.099	.094	.086	.081	.076	.070
	Minimum Premium Ratio	.624	.571	.538	.516	.497	.480	.465	.453	.441	.430	.409	.391	.374	.345

12	Basic Premium Ratio	.269	.187	.156	.139	.126	.116	.108	.101	.096	.091	.084	.079	.075	.069
	Minimum Premium Ratio	.618	.562	.533	.512	.493	.477	.463	.451	.440	.429	.408	.390	.374	.345
11	Basic Premium Ratio	.254	.167	.145	.130	.119	.110	.103	.097	.092	.088	.082	.077	.073	.068
	Minimum Premium Ratio	.611	.552	.527	.507	.490	.474	.461	.449	.438	.427	.407	.389	.373	.344
10	Basic Premium Ratio	.238	.150	.135	.122	.113	.105	.098	.093	.089	.085	.079	.075	.072	.067
	Minimum Premium Ratio	.603	.544	.522	.503	.487	.472	.458	.447	.436	.426	.406	.388	.372	.344
9	Basic Premium Ratio	.219	.138	.125	.115	.106	.100	.094	.089	.085	.082	.077	.073	.071	.066
	Minimum Premium Ratio	.593	.538	.517	.500	.483	.469	.456	.445	.434	.424	.405	.387	.372	.343
8	Basic Premium Ratio	.197	.127	.116	.107	.100	.094	.090	.086	.082	.079	.075	.072	.069	.065
	Minimum Premium Ratio	.582	.532	.513	.496	.480	.466	.454	.443	.433	.423	.404	.387	.371	.343
7	Basic Premium Ratio	.170	.117	.108	.100	.094	.089	.085	.082	.079	.077	.073	.070	.068	.064
	Minimum Premium Ratio	.569	.527	.509	.492	.477	.464	.452	.441	.431	.422	.403	.386	.370	.342
6	Basic Premium Ratio	.137	.107	.100	.094	.089	.085	.081	.078	.076	.074	.071	.068	.066	.064
	Minimum Premium Ratio	.552	.522	.505	.489	.475	.462	.450	.439	.430	.420	.402	.385	.369	.342
5	Basic Premium Ratio	.105	.098	.092	.087	.083	.080	.077	.075	.073	.071	.068	.066	.065	.063
	Minimum Premium Ratio	.536	.518	.501	.486	.472	.459	.448	.438	.428	.419	.400	.384	.369	.342

[Statutory Authority: RCW 51.04.020, 95-06-069, § 296-17-91905, filed 3/1/95, effective 4/10/95. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 88-24-010 (Order 88-26), § 296-17-91905, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91905, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91905, filed 8/8/86. Statutory Authority: RCW 51.16.035, 86-06-018 (Order 86-18), § 296-17-91905, filed 2/25/86.]

WAC 296-17-920 Assessment for supplemental pension fund. The amount of 23.6 mills (\$.0236) shall be retained by each employer from the earnings of each worker for each hour or fraction thereof the worker is employed. Provided that in classifications 6707 and 7102, the employer shall retain nineteen cents per day from each worker. The amount of money so retained from the employee shall be matched in an equal amount by each employer, except as otherwise provided in these rules, all such moneys shall be remitted to the department on or before the last day of January, April, July and October of each year for the preceding calendar quarter, provided self-insured employers shall remit to the department as provided under WAC 296-15-060. All such moneys shall be deposited in the supplemental pension fund.

[Statutory Authority: RCW 51.04.020, 95-23-080, § 296-17-920, filed 11/20/95, effective 1/1/96; 94-24-007, § 296-17-920, filed 11/28/94, effective 1/1/95; 93-24-114, § 296-17-920, filed 12/1/93, effective 1/1/94. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 92-24-063, § 296-17-920, filed 11/30/92, effective 1/1/93; 91-24-053, § 296-17-920, filed 11/27/91, effective 1/1/92; 89-24-051 (Order 89-22), § 296-17-920, filed 12/1/89, effective 1/1/90. Statutory Authority: RCW 51.04.020 and 51.32.073, 87-04-006 (Order 86-49), § 296-17-920, filed 1/23/87. Statutory Authority: RCW 51.16.035, 86-12-041 (Order 86-18), § 296-17-920, filed 5/30/86, effective 7/1/86; 83-24-017 (Order 83-36), § 296-17-920, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-920, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-920, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-920, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035, 79-12-086 (Order 79-18), § 296-17-920, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 78-12-043 (Order 78-23), § 296-17-920, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-920, filed 11/30/77, effective 1/1/78; Order 77-10, § 296-17-920, filed 5/31/77; Order 76-36, § 296-17-920, filed 11/30/76; Order 75-38, § 296-17-920, filed 11/24/75, effective 1/1/76; Order 75-28, § 296-17-920, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-920, filed 11/27/74, effective 1/1/75; Order 74-6, § 296-17-920, filed 1/23/74.]

Chapter 296-20 WAC

MEDICAL AID RULES

WAC

296-20-01002 Definitions.
296-20-135 Conversion factors.

296-20-17003 Repealed.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-20-17003 Fees. [Statutory Authority: RCW 51.04.020(4) and 51.04.030, 83-24-016 (Order 83-35), § 296-20-17003, filed 11/30/83, effective 1/1/84. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3), 80-18-033 (Order 80-24), § 296-20-17003, filed 12/1/80, effective 1/1/81; Order 77-27, § 296-20-17003, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-17003, filed 11/24/76, effective 1/1/77.] Repealed by 95-16-031, filed 7/21/95, effective 8/22/95. Statutory Authority: RCW 51.04.030, 70.14.050 and 51.04.020(4).

WAC 296-20-01002 Definitions. Termination of treatment: When treatment is no longer required and/or the industrial condition is stabilized, a report indicating the date of stabilization should be submitted to the department or self-insurer. This is necessary to initiate closure of the industrial claim. The patient may require continued treatment for conditions not related to the industrial condition; however, financial responsibility for such care must be the patient's.

Unusual or unlisted procedure: Value of unlisted services or procedures should be substantiated "by report" (BR).

"By report": BR (by report) in the value column of the fee schedules indicates that the value of this service is to be determined by report (BR) because the service is too unusual, variable or new to be assigned a unit value. The report shall provide an adequate definition or description of the services or procedures that explain why the services or procedures (e.g., operative, medical, radiological, laboratory, pathology, or other similar service report) are too unusual, variable, or complex to be assigned a relative value unit, using any of the following as indicated:

- (1) Diagnosis;
- (2) Size, location and number of lesion(s) or procedure(s) where appropriate;
- (3) Surgical procedure(s) and supplementary procedure(s);

- (4) Whenever possible, list the nearest similar procedure by number according to the fee schedules;
- (5) Estimated follow-up;
- (6) Operative time;
- (7) Describe in detail any service rendered and billed using an "unlisted" procedure code.

The department or self-insurer may adjust BR procedures when such action is indicated.

"Independent or separate procedure": Certain of the fee schedule's listed procedures are commonly carried out as an integral part of a total service, and as such do not warrant a separate charge. When such a procedure is carried out as a separate entity, not immediately related to other services, the indicated value for "independent procedure" is applicable.

Chart notes: This type of documentation may also be referred to as "office" or "progress" notes. Providers must maintain charts and records in order to support and justify the services provided. "Chart" means a compendium of medical records on an individual patient. "Record" means dated reports supporting bills submitted to the department or self-insurer for medical services provided in an office, nursing facility, hospital, outpatient, emergency room, or other place of service. Records of service shall be entered in a chronological order by the practitioner who rendered the service. For reimbursement purposes, such records shall be legible, and shall include but are not limited to:

- (1) Date(s) of service;
- (2) Patient's name and date of birth;
- (3) Claim number;
- (4) Name and title of the person performing the service;
- (5) Chief complaint or reason for each visit;
- (6) Pertinent medical history;
- (7) Pertinent findings on examination;
- (8) Medications and/or equipment/supplies prescribed or provided;
- (9) Description of treatment (when applicable);
- (10) Recommendations for additional treatments, procedures, or consultations;
- (11) X-rays, tests, and results; and
- (12) Plan of treatment/care/outcome.

Attending doctor report: This type of report may also be referred to as a "60 day" or "special" report. The following information must be included in this type of report. Also, additional information may be requested by the department as needed.

- (1) The condition(s) diagnosed including ICD-9-CM codes and the objective and subjective findings.
- (2) Their relationship, if any, to the industrial injury or exposure.
- (3) Outline of proposed treatment program, its length, components, and expected prognosis including an estimate of when treatment should be concluded and condition(s) stable. An estimated return to work date should be included. The probability, if any, of permanent partial disability resulting from industrial conditions should be noted.
- (4) If the worker has not returned to work, the attending doctor should indicate whether a vocational assessment will be necessary to evaluate the worker's ability to return to work and why.
- (5) If the worker has not returned to work, a doctor's estimate of physical capacities should be included with the

report. If further information regarding physical capacities is needed or required, a performance-based physical capacities evaluation can be requested. Performance-based physical capacities evaluations should be conducted by a licensed occupational therapist or a licensed physical therapist. Performance-based physical capacities evaluations may also be conducted by other qualified professionals who provided performance-based physical capacities evaluations to the department prior to May 20, 1987, and who have received written approval to continue supplying this service based on formal department review of their qualifications.

Consultation examination report: The following information must be included in this type of report. Additional information may be requested by the department as needed.

- (1) A detailed history to establish:
 - (a) The type and severity of the industrial injury or occupational disease.
 - (b) The patient's previous physical and mental health.
 - (c) Any social and emotional factors which may effect recovery.
- (2) A comparison history between history provided by attending doctor and injured worker, must be provided with exam.
- (3) A detailed physical examination concerning all systems affected by the industrial accident.
- (4) A general physical examination sufficient to demonstrate any preexisting impairments of function or concurrent condition.
- (5) A complete diagnosis of all pathological conditions including ICD-9-CM codes found to be listed:
 - (a) Due solely to injury.
 - (b) Preexisting condition aggravated by the injury and the extent of aggravation.
 - (c) Other medical conditions neither related to nor aggravated by the injury but which may retard recovery.
 - (d) Coexisting disease (arthritis, congenital deformities, heart disease, etc.).
- (6) Conclusions must include:
 - (a) Type treatment recommended for each pathological condition and the probable duration of treatment.
 - (b) Expected degree of recovery from the industrial condition.
 - (c) Probability, if any, of permanent disability resulting from the industrial condition.
 - (d) Probability of returning to work.
- (7) Reports of necessary, reasonable x-ray and laboratory studies to establish or confirm the diagnosis when indicated.

Bundled codes: When a bundled code is covered, payment for them is subsumed by the payment for the codes or services to which they are incident. (An example is a telephone call from a hospital nurse regarding care of a patient. This service is not separately payable because it is included in the payment for other services such as hospital visits.) Bundled codes and services are identified in the fee schedules.

Fee schedules or maximum fee schedule(s): The fee schedules consist of, but are not limited to the following:

- (a) Health Care Financing Administration's Common Procedure Coding System Level I and II Codes, descriptions

and modifiers that describe medical and other services, supplies and materials.

(b) Codes, descriptions and modifiers developed by the department.

(c) Relative value units (RVUs), calculated or assigned dollar values, percent-of-allowed-charges (POAC), or diagnostic related groups (DRGs), that set the maximum allowable fee for services rendered.

(d) Billing instructions or policies relating to the submission of bills by providers and the payment of bills by the department or self-insurer.

(e) Average wholesale price (AWP), baseline price (BLP), and policies related to the purchase of medications.

Average wholesale price (AWP): A pharmacy reimbursement formula by which the pharmacist is reimbursed for the cost of the product plus a mark-up. The AWP is an industry benchmark which is developed independently by companies that specifically monitor drug pricing.

Baseline price (BLP): Is derived by calculating the mean average for all NDC's (National Drug Code) in a specific product group, determining the standard deviation, and calculating a new mean average using all prices within one standard deviation of the original mean average. "Baseline price" is a drug pricing mechanism developed and updated by First Data Bank.

Medical aid rules: The Washington Administrative Codes (WACs) that contain the administrative rules for medical and other services rendered to workers.

Modified work status: The worker is not able to return to their previous work, but is physically capable of carrying out work of a lighter nature. Workers should be urged to return to modified work as soon as reasonable as such work is frequently beneficial for body conditioning and regaining self confidence.

Under RCW 51.32.090, when the employer has modified work available for the worker, the employer must furnish the doctor and the worker with a statement describing the available work in terms that will enable the doctor to relate the physical activities of the job to the worker's physical limitations and capabilities. The doctor shall then determine whether the worker is physically able to perform the work described. The employer may not increase the physical requirements of the job without requesting the opinion of the doctor as to the worker's ability to perform such additional work. If after a trial period of reemployment the worker is unable to continue with such work, the worker's time loss compensation will be resumed upon certification by the attending doctor.

If the employer has no modified work available, the department should be notified immediately, so vocational assessment can be conducted to determine whether the worker will require assistance in returning to work.

Regular work status: The injured worker is physically capable of returning to his/her regular work. It is the duty of the attending doctor to notify the worker and the department or self-insurer, as the case may be, of the specific date of release to return to regular work. Compensation will be terminated on the release date. Further treatment can be allowed as requested by the attending doctor if the condition is not stationary and such treatment is needed and otherwise in order.

Total temporary disability: Full-time loss compensation will be paid when the worker is unable to return to any type of reasonably continuous gainful employment as a direct result of an accepted industrial injury or exposure.

Temporary partial disability: Partial time loss compensation may be paid when the worker can return to work on a limited basis or return to lesser paying job is necessitated by the accepted injury or condition. The worker must have a reduction in wages of more than five percent before consideration of partial time loss can be made. No partial time loss compensation can be paid after the worker's condition is stationary.

All time loss compensation must be certified by the attending doctor based on objective findings.

Permanent partial disability: Any anatomic or functional abnormality or loss after maximum rehabilitation has been achieved, which is determined to be stable or nonprogressive at the time the evaluation is made. When the attending doctor has reason to believe a permanent impairment exists, the department or self-insurer should be notified. Specified disabilities (amputation or loss of function of extremities, loss of hearing or vision) are to be rated utilizing a nationally recognized impairment rating guide. Unspecified disabilities (internal injuries, spinal injuries, mental health, etc.) are to be rated utilizing the category system detailed under WAC 296-20-200 et al. for injuries occurring on or after October 1, 1974. **Under Washington law disability awards are based solely on physical or mental impairment due to the accepted injury or conditions without consideration of economic factors.**

Total permanent disability: Loss of both legs or arms, or one leg and one arm, total loss of eyesight, paralysis or other condition permanently incapacitating the worker from performing any work at any gainful employment. When the attending doctor feels a worker may be totally and permanently disabled, the attending doctor should communicate this information immediately to the department or self-insurer. A vocational evaluation and an independent rating of disability may be arranged by the department prior to a determination as to total permanent disability. Coverage for treatment does not usually continue after the date an injured worker is placed on pension.

Fatal: When the attending doctor has reason to believe a worker has died as a result of an industrial injury or exposure, the doctor should notify the nearest department service location or the self-insurer immediately. Often an autopsy is required by the department or self-insurer. If so, it will be authorized by the service location manager or the self-insurer. Benefits payable include burial stipend and monthly payments to the surviving spouse and/or dependents.

Doctor: For these rules, means a person licensed to practice one or more of the following professions: Medicine and surgery; osteopathic medicine and surgery; chiropractic; naturopathic physician; podiatry; dentistry; optometry.

Only those persons so licensed may sign report of accident forms and time loss cards except as provided in chapter 296-20 WAC.

Health services provider or provider: For these rules means any person, firm, corporation, partnership, association, agency, institution, or other legal entity providing any kind of services related to the treatment of an industrially injured worker. It includes, but is not limited to, hospitals, medical

doctors, dentists, chiropractors, vocational rehabilitation counselors, osteopathic physicians, pharmacists, podiatrists, physical therapists, occupational therapists, massage therapists, psychologists, naturopathic physicians, and durable medical equipment dealers.

Practitioner: For these rules, means any person defined as a "doctor" under these rules, or licensed to practice one or more of the following professions: Audiology; physical therapy; occupational therapy; pharmacy; prosthetics; orthotics; psychology; nursing; physician or osteopathic assistant; and massage therapy.

Physician: For these rules, means any person licensed to perform one or more of the following professions: Medicine and surgery; or osteopathic medicine and surgery.

Acceptance, accepted condition: Determination by a qualified representative of the department or self-insurer that reimbursement for the diagnosis and curative or rehabilitative treatment of a claimant's medical condition is the responsibility of the department or self-insurer. The condition being accepted must be specified by one or more diagnosis codes from the current edition of the International Classification of Diseases, Clinically Modified (ICD-CM).

Authorization: Notification by a qualified representative of the department or self-insurer that specific medically necessary treatment, services, or equipment provided for the diagnosis and curative or rehabilitative treatment of an accepted condition will be reimbursed by the department or self-insurer.

Medically necessary: Those health services are medically necessary which, in the opinion of the director or his or her designee, are:

(a) Proper and necessary for the diagnosis and curative or rehabilitative treatment of an accepted condition; and

(b) Reflective of accepted standards of good practice within the scope of the provider's license or certification; and

(c) Not delivered primarily for the convenience of the claimant, the claimant's attending doctor, or any other provider; and

(d) Provided at the least cost and in the least intensive setting of care consistent with the other provisions of this definition.

In no case shall services which are inappropriate to the accepted condition or which present hazards in excess of the expected medical benefits be considered medically necessary. Services which are controversial, obsolete, experimental, or investigational are presumed not to be medically necessary, and shall be authorized only as provided in WAC 296-20-03002(6).

Utilization review: The assessment of a claimant's medical care to assure that it is medically necessary and of good quality. This assessment typically considers the appropriateness of the place of care, level of care, and the duration, frequency or quantity of services provided in relation to the accepted condition being treated.

Emergent hospital admission: Placement of the worker in an acute care hospital for treatment of a work related medical condition of an unforeseen or rapidly progressing nature which if not treated in an inpatient setting, is likely to jeopardize the worker's health or treatment outcome.

Nonemergent (elective) hospital admission: Placement of the worker in an acute care hospital for medical treatment of an accepted condition which may be safely scheduled in advance without jeopardizing the worker's health or treatment outcome.

Attendant care: Those personal care services that assist a worker with dressing, feeding, and personal hygiene to facilitate self-care and are provided in order to maintain the worker in their place of temporary or permanent residence consistent with their needs, abilities, and safety. These services may be provided by but are not limited to, registered nurses, licensed practical nurses, registered nursing assistants, and other individuals such as family members.

Home nursing: Those nursing services that are medically necessary to maintain the worker in their place of temporary or permanent residence consistent with their needs, abilities, and safety. These services may be provided by but are not limited to, home health care, and hospice agencies on either an hourly or intermittent basis.

[Statutory Authority: RCW 51.04.030, 70.14.050 and 51.04.020(4). 95-16-031, § 296-20-01002, filed 7/21/95, effective 8/22/95. Statutory Authority: RCW 51.04.020, 51.04.030 and 1993 c 159. 93-16-072, § 296-20-01002, filed 8/1/93, effective 9/1/93. Statutory Authority: RCW 51.04.020(4) and 51.04.030. 92-24-066, § 296-20-01002, filed 12/1/92, effective 1/1/93; 92-05-041, § 296-20-01002, filed 2/13/92, effective 3/15/92. Statutory Authority: RCW 51.04.020. 90-14-009, § 296-20-01002, filed 6/25/90, effective 8/1/90. Statutory Authority: RCW 51.04.020(4) and 51.04.030. 90-04-057, § 296-20-01002, filed 2/2/90, effective 3/5/90; 87-24-050 (Order 87-23), § 296-20-01002, filed 11/30/87, effective 1/1/88; 86-20-074 (Order 86-36), § 296-20-01002, filed 10/1/86, effective 11/1/86; 83-24-016 (Order 83-35), § 296-20-01002, filed 11/30/83, effective 1/1/84; 83-16-066 (Order 83-23), § 296-20-01002, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-20-01002, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-20-01002, filed 12/23/80, effective 3/1/81.]

WAC 296-20-135 Conversion factors. (1) Conversion factors are used to calculate payment levels for services reimbursed under the Washington resource based relative value scale (RBRVS), and for anesthesia services payable with base and time units.

(2) **Washington RBRVS** services rendered on or after May 1, 1995, have a conversion factor of \$42.63. The fee schedules list the reimbursement levels for these services.

(3) **Anesthesia services** that are paid with base and time units have a conversion factor of \$1.81 per minute. The base units and payment policies can be found in the fee schedules.

(4) Services that do **not** use a conversion factor to establish reimbursement levels have dollar values, not relative values listed in the fee schedules.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 95-17-001 § 296-20-135, filed 8/2/95, effective 10/1/95; 95-05-072, § 296-20-135, filed 2/15/95, effective 3/18/95. Statutory Authority: RCW 51.04.020, 51.04.030 and 1993 c 159. 94-02-045 and 94-03-008, § 296-20-135, filed 12/30/93 and 1/6/94, effective 3/1/94; 93-16-072, § 296-20-135, filed 8/1/93, effective 9/1/93. Statutory Authority: RCW 51.04.020(4) and 51.04.030. 91-02-063, § 296-20-135, filed 12/28/90, effective 1/28/91; 88-24-011 (Order 88-28), § 296-20-135, filed 12/1/88, effective 1/1/89; 87-03-004 (Order 86-45), § 296-20-135, filed 1/8/87; 83-24-016 (Order 83-35), § 296-20-135, filed 11/30/83, effective 1/1/84; 82-24-050 (Order 82-39), § 296-20-135, filed 11/29/82, effective 7/1/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-20-135, filed 11/30/81, effective 1/1/82; 80-18-033 (Order 80-24), § 296-20-135, filed 12/1/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-20-135, filed 11/30/79, effective

1/1/80; Order 77-27, § 296-20-135, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-135, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-135, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-135, filed 1/30/74; Order 71-6, § 296-20-135, filed 6/1/71; Order 68-7, § 296-20-135, filed 11/27/68, effective 1/1/69.]

WAC 296-20-17003 Repealed. See Disposition Table at beginning of this chapter.

Chapter 296-23 WAC

RADIOLOGY, RADIATION THERAPY, NUCLEAR MEDICINE, PATHOLOGY, HOSPITAL, CHIROPRACTIC, PHYSICAL THERAPY, DRUGLESS THERAPEUTICS AND NURSING— DRUGLESS THERAPEUTICS, ETC.

WAC

296-23-220	Physical therapy rules.
296-23-230	Occupational therapy rules.
296-23-265	Independent medical examinations examiner.

WAC 296-23-220 Physical therapy rules. Practitioners should refer to WAC 296-20-010 through 296-20-125 for general information and rules pertaining to the care of workers.

Refer to WAC 296-20-132 and 296-20-135 regarding the use of conversion factors.

All supplies and materials must be billed using HCPCS Level II codes. Refer to chapter 296-21 WAC for additional information. HCPCS codes are listed in the fee schedules.

Refer to chapter 296-20 WAC (WAC 296-20-125) and to the department's billing instructions for additional information.

Physical therapy treatment will be reimbursed only when ordered by the worker's attending doctor and rendered by a licensed physical therapist or a physical therapist assistant serving under the direction of a licensed physical therapist. Doctors rendering physical therapy should refer to WAC 296-21-095.

The department or self-insurer will review the quality and medical necessity of physical therapy services provided to workers. Practitioners should refer to WAC 296-20-01002 for the department's rules regarding medical necessity and to WAC 296-20-024 for the department's rules regarding utilization review and quality assurance.

The department or self-insurer will pay for a maximum of one physical therapy visit per day. When multiple treatments (different billing codes) are performed on one day, the department or self-insurer will pay either the sum of the individual fee maximums, the provider's usual and customary charge, or \$72.04 whichever is less. These limits will not apply to physical therapy that is rendered as part of a physical capacities evaluation, work hardening program, or pain management program, provided a qualified representative of the department or self-insurer has authorized the service.

The department will publish specific billing instructions, utilization review guidelines, and reporting requirements for physical therapists who render care to workers.

Use of diapulse or similar machines on workers is not authorized. See WAC 296-20-03002 for further information.

A physical therapy progress report must be submitted to the attending doctor and the department or the self-insurer following twelve treatment visits or one month, whichever occurs first. Physical therapy treatment beyond initial twelve treatments will be authorized only upon substantiation of improvement in the worker's condition. An outline of the proposed treatment program, the expected restoration goals, and the expected length of treatment will be required.

Physical therapy services rendered in the home and/or places other than the practitioner's usual and customary office, clinic, or business facilities will be allowed only upon prior authorization by the department or self-insurer.

No inpatient physical therapy treatment will be allowed when such treatment constitutes the only or major treatment received by the worker. See WAC 296-20-030 for further information.

The department may discount maximum fees for treatment performed on a group basis in cases where the treatment provided consists of a nonindividualized course of therapy (e.g., pool therapy; group aerobics; and back classes).

Biofeedback treatment may be rendered on doctor's orders only. The extent of biofeedback treatment is limited to those procedures allowed within the scope of practice of a licensed physical therapist. See chapter 296-21 WAC for rules pertaining to conditions authorized and report requirements.

Billing codes and reimbursement levels are listed in the fee schedules.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 95-05-072, § 296-23-220, filed 2/15/95, effective 3/18/95. Statutory Authority: RCW 51.04.020, 51.04.030 and 1993 c 159. 94-02-045, § 296-23-220, filed 12/30/93, effective 3/1/94; 93-16-072, § 296-23-220, filed 8/1/93, effective 9/1/93.]

WAC 296-23-230 Occupational therapy rules. Practitioners should refer to WAC 296-20-010 through 296-20-125 for general information and rules pertaining to the care of workers.

Refer to WAC 296-20-132 and 296-20-135 for information regarding the conversion factors.

All supplies and materials must be billed using HCPCS Level II codes, refer to the department's billing instructions for additional information.

Occupational therapy treatment will be reimbursed only when ordered by the worker's attending doctor and rendered by a licensed occupational therapist or an occupational therapist assistant serving under the direction of a licensed occupational therapist. Vocational counselors assigned to injured workers by the department or self-insurer may request an occupational therapy evaluation. However, occupational therapy treatment must be ordered by the worker's attending doctor.

An occupational therapy progress report must be submitted to the attending doctor and the department or self-insurer following twelve treatment visits or one month, whichever occurs first. Occupational therapy treatment beyond the initial twelve treatments will be authorized only upon substantiation of improvement in the worker's condition. An outline of the proposed treatment program, the expected restoration goals, and the expected length of treatment will be required.

The department or self-insurer will review the quality and medical necessity of occupational therapy services. Practitioners should refer to WAC 296-20-01002 for the department's definition of medically necessary and to WAC 296-20-024 for the department's rules regarding utilization review and quality assurance.

The department will pay for a maximum of one occupational therapy visit per day. When multiple treatments (different billing codes) are performed on one day, the department or self-insurer will pay either the sum of the individual fee maximums, the provider's usual and customary charge, or \$72.04 whichever is less. These limits will not apply to occupational therapy which is rendered as part of a physical capacities evaluation, work hardening program, or pain management program, provided a qualified representative of the department or self-insurer has authorized the service.

The department will publish specific billing instructions, utilization review guidelines, and reporting requirements for occupational therapists who render care to workers.

Occupational therapy services rendered in the worker's home and/or places other than the practitioner's usual and customary office, clinic, or business facility will be allowed only upon prior authorization by the department or self-insurer.

No inpatient occupational therapy treatment will be allowed when such treatment constitutes the only or major treatment received by the worker. See WAC 296-20-030 for further information.

The department may discount maximum fees for treatment performed on a group basis in cases where the treatment provided consists of a nonindividualized course of therapy (e.g., pool therapy; group aerobics; and back classes).

Billing codes, reimbursement levels, and supporting policies for occupational therapy services are listed in the fee schedules.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 95-05-072, § 296-23-230, filed 2/15/95, effective 3/18/95. Statutory Authority: RCW 51.04.020, 51.04.030 and 1993 c 159. 94-02-045, § 296-23-230, filed 12/30/93, effective 3/1/94; 93-16-072, § 296-23-230, filed 8/1/93, effective 9/1/93.]

WAC 296-23-265 Independent medical examinations examiner. (1) Independent medical examinations must be performed in accordance with WAC 296-20-200 by examiners approved by the department and licensed to perform medicine and surgery, osteopathic medicine and surgery, podiatric medicine and surgery, chiropractic, or dentistry except:

(a) Attending physicians licensed to perform medicine and surgery, osteopathic medicine and surgery, podiatric medicine and surgery, or dentistry may perform an impairment rating examination for a worker under their care at the direction of the state fund or self-insurer.

(b) The independent medical examination may be performed by a board certified specialist licensed to perform medicine and surgery, osteopathic medicine and surgery, podiatric medicine and surgery, or dentistry selected by the department or the self-insurer if the worker does not live in Washington, Oregon, or Idaho.

(c) The independent medical examination may be performed by a treating physician in a department approved chronic pain management program accredited by the commission on accreditation of rehabilitation facilities. The examiner must be licensed to perform medicine and surgery, osteopathic medicine and surgery, podiatric medicine and surgery, or dentistry.

(2) All other examiners who wish to do independent medical examinations of workers under Title 51 RCW, whether purchased by the department or self-insurers, must:

(a) Submit a completed department application to the medical director at the department of labor and industries; and

(b) Receive the medical director's approval to be an "approved examiner."

(3) Approved examiners will be listed on the department's approved examiners list. Examiners may be suspended or removed from the approved examiners list by the medical director. Such examiners shall not receive worker referrals from the department or self-insurers.

(4) The factors the medical director may consider in approving or disapproving or suspending examiners include, but are not limited to, any one or a combination of the following:

(a) Board certification;

(b) Complaints from workers about the conduct of the examiner;

(c) Disciplinary proceedings or actions;

(d) Experience in direct patient care in the area of specialty;

(e) Ability to effectively convey and substantiate medical opinions and conclusions concerning workers;

(f) Quality and timeliness of reports; and

(g) Geographical need of the department and self-insurer.

(5) Examiners must be available and willing to testify at the department fee schedule rate on behalf of the department, worker, or employer.

(6) Complaints from workers about examiner conduct during an independent medical examination must be promptly forwarded from self-insurer and department staff to the office of the medical director.

(7) The standards for independent medical examiners, the application for approved examiner status and maximum fee schedule for performing examinations are published in a medical examiners' handbook available from the Office of the Medical Director, Department of Labor and Industries, Olympia, WA 98504.

(8) Fees for independent medical examinations are determined by the dollar value published in the medical examiners' handbook.

[Statutory Authority: RCW 51.32.112. 95-04-056, § 296-23-265, filed 1/26/95, effective 3/1/95. Statutory Authority: RCW 51.04.020, 51.04.030 and 1993 c 159. 93-16-072, § 296-23-265, filed 8/1/93, effective 9/1/93.]

Chapter 296-23A WAC

HOSPITALS

WAC

296-23A-400 Hospital outpatient physical therapy rules.

WAC 296-23A-400 Hospital outpatient physical therapy rules. Hospitals should refer to chapter 296-20 WAC for general information and rules, and to department billing instructions pertaining to the care of workers and the billing of services.

The procedure codes and maximum allowable fees for physical therapy services are listed in the fee schedules. Also refer to WAC 296-20-132 and 296-20-135 regarding use of the conversion factor.

Physical therapy treatment will be reimbursed only when ordered by the worker's attending doctor and rendered by a licensed physical therapist or a physical therapist assistant serving under the direction of a licensed physical therapist.

The department or self-insurer will review the quality and medical necessity of physical therapy services. Practitioners should refer to WAC 296-20-01002 for the department's definition of medically necessary and to WAC 296-20-024 for the department's rules regarding utilization review and quality assurance.

The department or self-insurer will pay for a maximum of one physical therapy visit per day. When multiple treatments (different billing codes) are performed on one day, the department or self-insurer will pay either the sum of the individual fee maximums, the provider's usual and customary charge, or a flat dollar rate of \$72.04, whichever is less. These limits will not apply to physical therapy which is rendered as part of a physical capacities evaluation, work hardening program, or pain management program, provided a qualified representative of the department or self-insurer has authorized the service.

The department will publish specific billing instructions, utilization review guidelines, and reporting requirements for physical therapists who render care to workers.

Use of diaphuse or similar machines on workers is not authorized. See WAC 296-20-03002 for further information.

No inpatient physical therapy treatment will be allowed when such treatment constitutes the only or major treatment received by the worker. See WAC 296-20-075 and 296-23A-100 for further information.

Biofeedback treatment may be rendered on physician's orders only. The extent of biofeedback treatment is limited to those procedures allowed within the scope of practice of a licensed physical therapist. See chapter 296-21 WAC and department policy for rules pertaining to the authorized conditions and the reporting requirements. The department may discount maximum fees for treatment performed on a group basis in cases where the treatment provided consists of a nonindividualized course of therapy (e.g., pool therapy; group aerobics; and back classes).

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 95-05-072, § 296-23A-400, filed 2/15/95, effective 3/18/95. Statutory Authority: RCW 51.04.020, 51.04.030 and 1993 c 159. 94-02-045, § 296-23A-400, filed 12/30/93, effective 3/1/94; 93-16-072, § 296-23A-400, filed 8/1/93, effective 9/1/93. Statutory Authority: RCW 51.04.020(4) and 51.04.030. 89-08-002

(Order 89-01), § 296-23A-400, filed 3/23/89, effective 5/1/89; 87-03-005 (Order 86-47), § 296-23A-400, filed 1/8/87.]

Chapter 296-24 WAC

GENERAL SAFETY AND HEALTH STANDARDS

WAC

296-24-12001	Scope.
296-24-13501	Color identification.
296-24-14011	Accident prevention tags.
296-24-19501	Definitions.
296-24-19514	Reports of injuries to employees operating mechanical power presses.
296-24-19517	Presence sensing device initiation (PSDI).
296-24-33003	Scope.
296-24-58503	Scope, application and definitions applicable.
296-24-73501	General requirements.

WAC 296-24-12001 Scope. This scope includes all sections of WAC 296-24-120 in the numbering and applies to all permanent places of employment except where domestic, or mining work only is performed. The shower requirements in WAC 296-24-12009(3) are not applicable to agricultural operations. Measures for the control of toxic materials are considered to be outside the scope of this section.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-24-12001, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 94-06-068 (Order 93-17), § 296-24-12001, filed 3/2/94, effective 3/1/95; Order 74-27, § 296-24-12001, filed 5/7/74; Order 73-5, § 296-24-12001, filed 5/9/73 and Order 73-4, § 296-24-12001, filed 5/7/73.]

WAC 296-24-13501 Color identification. (1) Red. Red shall be the basic color for the identification of:

(a) Fire protection equipment and apparatus, except motorized apparatus, as used on roads.

(b) Danger. Safety cans or other portable containers of flammable liquids having a flashpoint at or below 80°F. table containers of flammable liquids (open cup tester), excluding shipping containers, shall be painted red with some additional clearly visible identification either in the form of a yellow band around the can or the name of the contents conspicuously stenciled or painted on the can in yellow. Red lights shall be provided at barricades and at temporary obstructions, as specified in ANSI Safety Code for Building Construction, A10.2-1944. Danger signs shall be painted red.

(c) Stop. Emergency stop bars on hazardous machines such as rubber mills, wire blocks, flat work ironers, etc., shall be red. Stop buttons or electrical switches used for emergency stopping of machinery shall be red.

(2) Yellow. Yellow shall be the basic color for designating caution and for marking physical hazards such as: Striking against, stumbling, falling, tripping, and "caught in between."

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-24-13501, filed 10/20/95, effective 1/16/96. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-24-13501, filed 6/11/82; Order 73-5, § 296-24-13501, filed 5/9/73 and Order 73-4, § 296-24-13501, filed 5/7/73.]

WAC 296-24-14011 Accident prevention tags. (1) Scope and purpose.

(a) This section applies to all accident prevention tags used to identify hazardous conditions and provide a message to employees with respect to hazardous conditions as set forth in subsection (3) of this section, or to meet the specific requirements of other WAC requirements.

(b) Tags are a temporary means of warning all concerned of a hazardous condition, defective equipment, radiation hazards, etc. The tags are not to be considered as a complete warning method, but should be used until a positive means can be employed to eliminate the hazard; for example, a "do not start" tag on power equipment shall be used for a few moments or a very short time until the switch in the system can be locked out; a "defective equipment" tag shall be placed on a damaged ladder and immediate arrangements made for the ladder to be taken out of service and sent to the repair shop.

(c) This section does not apply to construction.

(2) Definitions.

(a) "Biological hazard" or "**Biohazard**" means those infectious agents presenting a risk of death, injury or illness to employees.

(b) "Major message" means that portion of a tag's inscription that is more specific than the signal word and that indicates the specific hazardous condition or the instruction to be communicated to the employee. Examples include: "High Voltage," "Close Clearance," "Do Not Start," or "Do Not Use" or a corresponding pictograph used with a written text or alone.

(c) "Pictograph" means a pictorial representation used to identify a hazardous condition or to convey a safety instruction.

(d) "Signal word" means that portion of a tag's inscription that contains the word or words that are intended to capture the employee's immediate attention.

(e) "Tag" means a device usually made of card, paper, pasteboard, plastic or other material used to identify a hazardous condition.

(3) Use.

(a) Tags shall be used as a means to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, equipment or operations which are out of the ordinary, unexpected or not readily apparent.

(b) Tags shall be used until such time as the identified hazard is eliminated or the hazardous operation is completed. Tags need not be used where signs, guarding or other positive means of protection are being used.

(c) Do not start tags shall be placed in a conspicuous location or shall be placed in such a manner that they effectively block the starting mechanism which would cause hazardous conditions should the equipment be energized. See Fig. J-11.

(4) General tag criteria.

(a) All required tags shall meet the following criteria:

(i) Tags shall contain a signal word and a major message.

(ii) The signal word shall be either "Danger," "Caution," or "Biological Hazard," "biohazard," or the biological hazard symbol.

(iii) The major message shall indicate the specific hazardous condition or the instruction to be communicated to the employee.

(b) The signal word shall be readable at a minimum distance of five feet (1.52 m) or such greater distance as warranted by the hazard.

(c) The tag's major message shall be presented in either pictographs, written text or both.

(d) The signal word and the major message shall be understandable to all employees who may be exposed to the identified hazard.

(e) All employees shall be informed as to the meaning of the various tags used throughout the workplace and what special precautions are necessary.

(f) Tags shall be affixed as close as safely possible to their respective hazards by a positive means such as string, wire, or adhesive that prevents their loss or unintentional removal.

(g) The tag and attachment method or device used shall be constructed of such material that they will not be likely to deteriorate in the environment in which the tag is used during the time period of intended use.

(5) Danger tags.

(a) Danger tags shall be used in major hazard situations where an immediate hazard presents a threat of death or serious injury to employees. Danger tags shall be used only in these situations. See Fig. J-11.

(b) All employees should be instructed that danger tags indicate immediate danger and that special precautions are necessary.

(6) Caution tags.

(a) Caution tags shall be used in minor hazard situations where a nonimmediate or potential hazard or unsafe practice presents a lesser threat of employee injury. Caution tags shall be used only in these situations. See Fig. J-12.

(b) All employees should be instructed that caution tags indicate a possible hazard against which proper precautions should be taken.

(7) Warning tags. Warning tags may be used to represent a hazard level between "Caution" and "Danger," instead of the required "Caution" tag, provided that they have a signal word of "Warning," an appropriate major message, and otherwise meet the general tag criteria of subsection (4) of this section.

(8) Out of order tags. Out of order tags should be used only for the specific purpose of indicating that a piece of equipment, machinery, etc., is out of order and to attempt to use it might present a hazard. (See Fig. J-13.)

(9) Radiation tags.

(a) The standard background for radiation tags shall be yellow; the panel shall be reddish purple. Any letters used against the yellow background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1, Fundamental Specification of Safety Colors for CIE Standard Source "C" American National Standards Institute, Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment, Z53.1-1971.

(b) The method of dimension, design, and orientation of the standard symbol (one blade pointed downward and centered on the vertical axis) shall be executed as illustrated in Figure J-14. The symbol shall be prominently displayed

and of a size consistent with the size of the equipment or area in which it is to be used.

(10) Biological hazard tags.

(a) Biological hazard tags shall be used to identify the actual or potential presence of a biological hazard and to identify equipment, containers, rooms, experimental animals, or combinations thereof, that contain or are contaminated with hazardous biological agents.

(b) The symbol design for biological hazard tags shall conform to the design shown in Fig. J-15.

(11) Other tags. Other tags may be used in addition to those required by this section or in other situations where this section does not require tags, provided that they do not detract from the impact or visibility of the signal word and major message of any required tag.

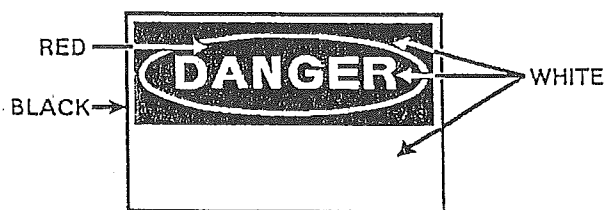


Fig. J-1
Danger Sign

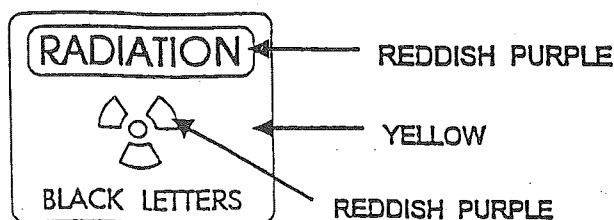


Fig. J-2
Radiation Warning Sign

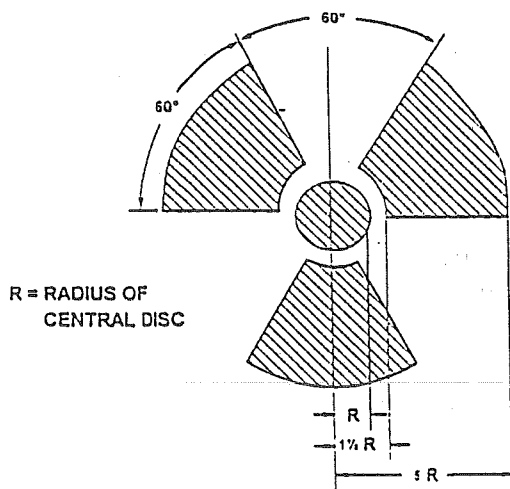


Fig. J-3
Standard Radiation Symbol

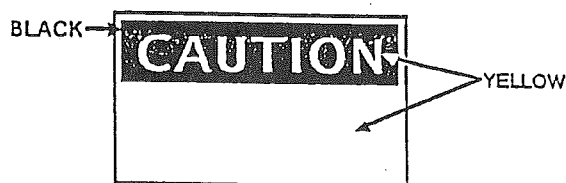


Fig. J-4
Caution Sign

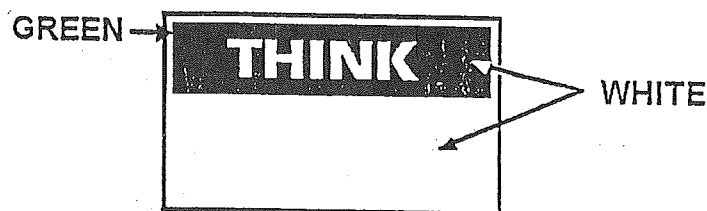
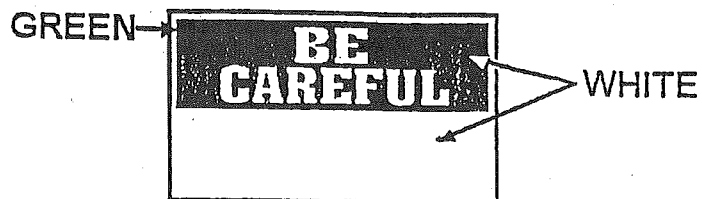


Fig. J-5
Safety Instruction Signs

(Note: The words "think" and "be careful," given here, are only illustrations. Other wordings may be used.)

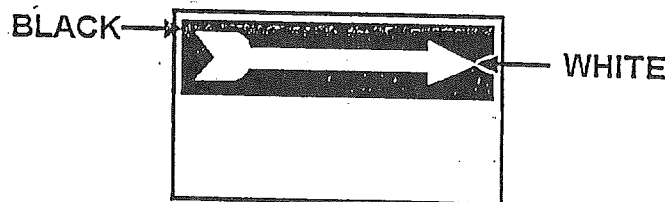


Fig. J-6
Directional Signs

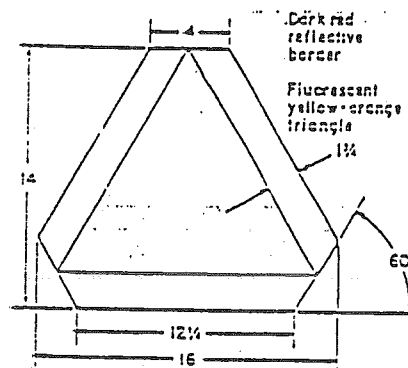


Fig. J-7
Slow-Moving Vehicle Emblem

Note: All dimensions are in inches.

POISON:



ELECTRICITY:

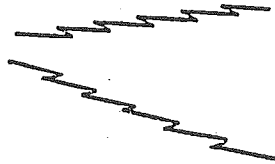


Fig. J-8

Symbols Used on Signs

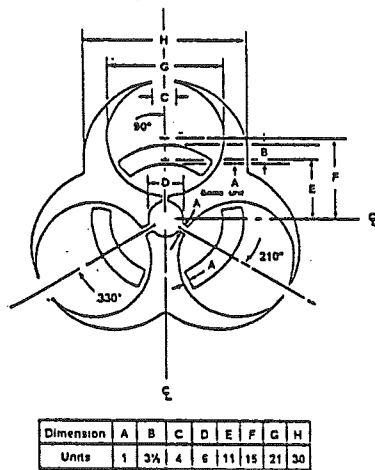
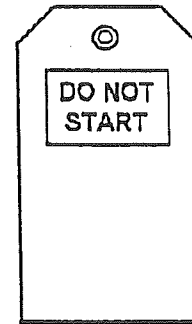


Fig. J-9

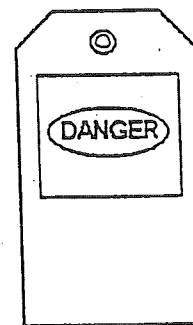
Symbol for Biological Hazard



White tag
white letters on
red square

Fig. J-10

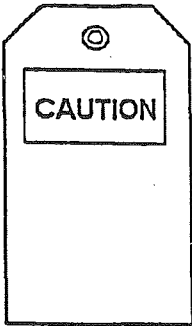
Do Not Start Tag



White tag
white letters on
red oval with a
black square

Fig. J-11

Danger Tag



Yellow tag
yellow letters on a
black background

Fig. J-12
Caution Tag

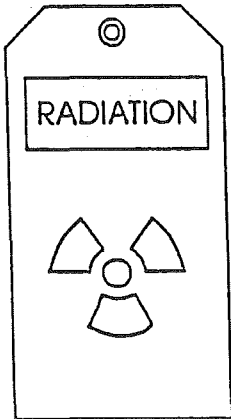
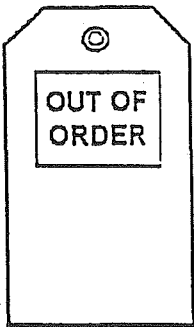


Fig. J-14
Radiation Tag



White tag
white letters on
black background

Fig. J-13
Out of Order Tag

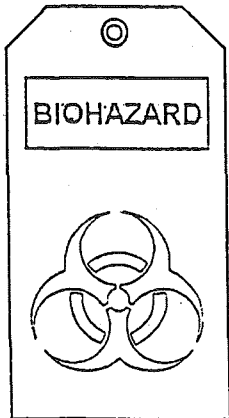


Fig. J-15
Biological Hazard Tag
TABLE J-1

STANDARD PROPORTIONS FOR DANGER SIGNS

Sign size, inches	Black rectangular panel, inches	Red oval, inches	Word danger, height	Maximum space available for sign wording, inches
Height	Height	Height	Height	
Width	Width	Width	Width	
HORIZONTAL PATTERN				
7x10	3 1/4 x 9 3/8	2 7/8 x 8 1/2	1 7/16	2 3/4 x 9 3/8
10x14	4 5/8 x 13 3/8	4 1/8 x 11 7/8	2 1/16	4 1/4 x 13 3/8
14x20	6 1/2 x 19 3/8	5 3/4 x 17	2 7/8	6 1/4 x 19 3/8
20x28	9 1/4 x 27 3/8	8 1/4 x 23 7/8	4 1/8	9 1/2 x 27 3/8

UPRIGHT PATTERN

10x 7	2 3/8 x 6 3/8	2 1/8 x 5 7/8	1 1/16	6 3/8 x 6 3/8
14x10	3 1/4 x 9 3/8	2 7/8 x 8 1/2	1 7/16	9 1/2 x 9 3/8
20x14	4 5/8 x 13 3/8	4 1/8 x 11 7/8	2 1/16	14 x 13 3/8
28x20	6 1/2 x 19 3/8	5 3/4 x 17	2 7/8	20 1/4 x 19 3/8

TABLE J-2

STANDARD PROPORTIONS FOR CAUTION SIGNS

Sign size, inches height width	Black rectangular panel, inches height width	Word "Caution" height of letter, inches	Maximum space available for sign wording below panel inches height width
--------------------------------	--	---	--

HORIZONTAL PATTERN

7 x 10	2 1/4 x 9 3/8	1 5/8	3 1/4 x 9 3/8
10 x 14	3 1/4 x 13 3/8	2 1/4	5 1/2 x 13 3/8
14 x 20	3 3/4 x 19 3/8	2 3/4	9 x 19 3/8
20 x 28	4 1/4 x 27 3/8	3 1/4	14 1/2 x 27 3/8

UPRIGHT PATTERN

10 x 7	1 5/8 x 6 3/8	1 1/8	7 x 6 3/8
14 x 10	2 1/4 x 9 3/8	1 5/8	10 1/2 x 9 3/8
20 x 14	3 1/4 x 13 3/8	2 1/4	15 1/2 x 13 3/8
28 x 20	3 3/4 x 19 3/8	2 3/4	24 x 19 3/8

TABLE J-3

STANDARD PROPORTIONS FOR SAFETY INSTRUCTION SIGNS

(TABLE J-3: PART 1—"Think" Safety Sign)

Sign size, inches, height, width	Maximum Green rectangular panel, inches, height, width	Word "Think" height letters, inches	Space available for sign wording below panel, inches height, width
7x10	2 3/4 x 9 3/8	1 5/8	3 1/2 x 9 3/8
10x14	3 1/4 x 13 3/8	2 1/4	5 1/2 x 13 3/8
14x20	3 3/4 x 19 3/8	2 3/4	9 x 19 3/8
20x28	4 1/4 x 27 3/8	3 1/4	14 1/2 x 27 3/8

(TABLE J-3: PART 2—"Be Careful" Safety Sign)

Sign size, inches height, width	Maximum Green panel, inches, height, width	Word "Be" height of letters, inches	Word "Careful" height of letters, inches	Space available for sign wording below panel, inches height, width
7x10	3 3/8 x 9 3/8	1 1/4	1 3/16	2 1/2 x 9 3/8
10x14	4 1/4 x 13 3/8	1 3/4	2 3/16	4 x 13 3/8
14x20	6 1/4 x 19 3/8	2 1/2	3 1/8	6 x 19 3/8
20x28	9 1/2 x 27 3/8	3 1/2	4 3/8	9 1/4 x 27 3/8

TABLE J-4

STANDARD PROPORTIONS FOR DIRECTIONAL SIGNS

Sign size inches height	Black rectangular panel, inches height width	Overall length	White arrow, inches Arrow head height width	Arrow shaft height	Arrow tail height width	Maximum space for sign wording below panel height
6 1/2x14	3 1/4 x 13 3/8	12 5/8	2 3/4 x 3	1 1/8	2 3/8 x 3 1/4	2 1/4 x 13 3/8
9x20	4 1/2 x 19 3/8	18 5/8	3 3/4 x 4 1/8	1 5/8	3 1/4 x 4 1/2	3 3/8 x 19 3/8
12x28	6 x 27 3/8	26 5/8	5 1/8 x 5 5/8	2 1/8 6	4 3/8 x 27 3/8	4 3/4 x
15x36	7 1/2 x 35 3/8	34 5/8	6 3/8 x 6 7/8	2 5/8	5 1/2 x 7 1/2	6 1/4 x 35 3/8

Appendix A—Recommended color coding.

While the standard does not specifically mandate colors to be used on accident prevention tags, the following color scheme is recommended by OSHA for meeting the requirements of this section:

"DANGER"—Red, or predominantly red, with lettering or symbols in a contrasting color.

"CAUTION"—Yellow, or predominantly yellow, with lettering or symbols in a contrasting color.

"WARNING"—Orange, or predominantly orange, with lettering or symbols in a contrasting color.

"BIOLOGICAL HAZARD"—Fluorescent orange or orange-red, or predominantly so, with lettering or symbols in a contrasting color.

Appendix B—References for further information.

The following references provide information which can be helpful in understanding the requirements contained in various sections of the standard:

1. Bresnahan, Thomas F., and Bryk, Joseph. "The Hazard Association Values of Accident Prevention Signs", *Journal of American Society of Safety Engineers*: January 1975.
2. Dreyfuss, H., *Symbol Sourcebook*, McGraw Hill: New York, NY, 1972.
3. Glass, R. A. and others, *Some Criteria for Colors and Signs in Workplaces*, National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, 1983.
4. *Graphic Symbols for Public Areas and Occupational Environments*, Treasury Board of Canada, Ottawa, Canada, July 1980.
5. Howett, G. L., *Size of Letters Required for Visibility as a Function of Viewing Distance and Observer Acuity*, National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, July 1983.
6. Lerner, N. D., and Collins, B. L., *The Assessment of Safety Symbol Understandability by Different Testing Methods*, National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, 1980.
7. Lerner, N. D. and Collins, B. L., *Workplace Safety Symbols*, National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, 1980.
8. Modley, R. and Meyers, W. R., *Handbook of Pictorial Symbols*, Dover Publication, New York, NY, 1976.
9. *Product Safety Signs and Labels*, FMC Corporation, Santa Clara, CA, 1978.
10. *Safety Color Coding for Marking Physical Hazards*, Z53.1, American National Standards Institute, 11 West 42nd Street, New York, NY 10036, 1979.

11. *Signs and Symbols for the Occupational Environment, Can. 3-Z-321-77, Canadian Standards Association, Rexdale, Ontario M9W 1R3, September 1977.*

12. *Symbols for Industrial Safety, National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, April 1982.*

13. *Symbol Signs, U.S. Department of Transportation, Washington D.C., November 1974.*

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-24-14011, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-24-14011, filed 7/20/94, effective 9/20/94; 94-06-068 (Order 93-17), § 296-24-14011, filed 3/2/94, effective 3/1/95. Statutory Authority: RCW 49.17.050(2) and 49.14.040 [49.17.040]. 87-07-022 (Order 87-01), § 296-24-14011, filed 3/12/87; Order 76-6, § 296-24-14011, filed 3/1/76; Order 73-5, § 296-24-14011, filed 5/9/73 and Order 73-4, § 296-24-14011, filed 5/7/73.]

WAC 296-24-19501 Definitions. "Adjustable barrier guard" means a barrier requiring adjustment for each job or die setup.

"Antirepeat" means the part of the clutch/brake control system designed to limit the press to a single stroke if the tripping means is held operated. Antirepeat requires release of all tripping mechanisms before another stroke can be initiated. "Antirepeat" is also called single stroke reset or reset circuit.

"Authorized person" means one to whom the authority and responsibility to perform a specific assignment has been given by the employer.

"Automatic feeding" means feeding wherein the material or part being processed is placed within or removed from the point of operation by a method or means not requiring action by an operator on each stroke of the press.

"Bolster plate" means the plate attached to the top of the bed of the press having drilled holes or T-slots for attaching the lower die or die shoe.

"Brake" means the mechanism used on a mechanical power press to stop and/or hold the crankshaft, either directly or through a gear train, when the clutch is disengaged.

"Brake monitor" means a sensor designed, constructed, and arranged to monitor the effectiveness of the press braking system.

"Certification" or "certify" means, in the case of design certification/validation, that the manufacturer has reviewed and tested the design and manufacture, and in the case of installation certification/validation and annual recertification/revalidation, that the employer has reviewed and tested the installation, and concludes in both cases that the requirements of WAC 296-24-19503 through 296-24-19517 and WAC 296-24-20700 have been met. The certifications are made to the validation organization.

"Certification/validation" and "certify/validate" means the combined process of certification and validation.

"Clutch" means the coupling mechanism used on a mechanical power press to couple the flywheel to the crankshaft, either directly or through a gear train.

"Concurrent" means acting in conjunction, and is used to describe a situation wherein two or more controls exist in an operated condition at the same time.

"Continuous" means uninterrupted multiple strokes of the slide without intervening stops (or other clutch control action) at the end of individual strokes.

"Control system" means sensors, manual input and mode selection elements, interlocking and decision-making circuitry, and output elements to the press operating mechanism.

"Counterbalance" means the mechanism that is used to balance or support the weight of the connecting rods, slide, and slide attachments.

"Device" means a press control or attachment that:

- Restrains the operator from inadvertently reaching into the point of operation; or
- Prevents normal press operation if the operator's hands are inadvertently within the point of operation; or
- Automatically withdraws the operator's hands if the operator's hands are inadvertently within the point of operation as the dies close; or
- Prevents the initiation of a stroke, or stops the stroke in progress, when there is an intrusion through the sensing field by any part of the operator's body or by any other object.

"Die" means the tooling used in a press for cutting or forming material. An upper and a lower die make a complete set.

"Die builder" means any person who builds dies for power presses.

"Die enclosure guard" means an enclosure attached to the die shoe or stripper, or both, in a fixed position.

"Die set" means a tool holder held in alignment by guide posts and bushings and consisting of a lower shoe, an upper shoe or punch holder, and guide posts and bushings.

"Die setter" means an individual who places or removes dies in or from mechanical power presses, and who, as a part of their duties, makes the necessary adjustments to cause the tooling to function properly and safely.

"Die setting" means the process of placing or removing dies in or from a mechanical power press, and the process of adjusting the dies, other tooling and safeguarding means to cause them to function properly and safely.

"Die shoe" means a plate or block upon which a die holder is mounted. A die shoe functions primarily as a base for the complete die assembly, and, when used, is bolted or clamped to the bolster plate or the face of slide.

"Direct drive" means the type of driving arrangement wherein no clutch is used; coupling and decoupling of the driving torque is accomplished by energization and deenergization of a motor. Even though not employing a clutch, direct drives match the operational characteristics of "part revolution clutches" because the driving power may be disengaged during the stroke of the press.

"Ejector" means a mechanism for removing work or material from between the dies.

"Face of slide" means the bottom surface of the slide to which the punch or upper die is generally attached.

"Feeding" means the process of placing or removing material within or from the point of operation.

"Fixed barrier guard" means a die space barrier attached to the press frame.

"Foot control" means the foot operated control mechanism designed to be used with a clutch or clutch/brake control system.

"Foot pedal" means the foot operated lever designed to operate the mechanical linkage that trips a full revolution clutch.

"Full revolution clutch" means a type of clutch that, when tripped, cannot be disengaged until the crankshaft has completed a full revolution and the press slide a full stroke.

"Gate or movable barrier device" means a movable barrier arranged to enclose the point of operation before the press stroke can be started.

"Guard" means a barrier that prevents entry of the operator's hands or fingers into the point of operation.

"Guide post" means the pin attached to the upper or lower die shoe, operating within the bushing on the opposing die shoe, to maintain the alignment of the upper and lower dies.

"Hand feeding tool" means any hand held tool designed for placing or removing material or parts to be processed within or from the point of operation.

"Holdout or restraint device" means a mechanism, including attachments for operator's hands, that when anchored and adjusted prevent the operator's hands from entering the point of operation.

"Inch" means an intermittent motion imparted to the slide (on machines using part revolution clutches) by momentary operation of the "inch" operating means. Operation of the "inch" operating means engages the driving clutch so that a small portion of one stroke or indefinite stroking can occur, depending upon the length of time the "inch" operating means is held operated. "Inch" is a function used by the die setter for setup of dies and tooling, but is not intended for use during production operations by the operator.

"Interlocked press barrier guard" means a barrier attached to the press frame and interlocked so that the press stroke cannot be started normally unless the guard itself, or its hinged or movable sections, enclose the point of operation.

"Jog" means an intermittent motion imparted to the slide by momentary operation of the drive motor, after the clutch is engaged with the flywheel at rest.

"Knockout" means a mechanism for releasing material from either die.

"Liftout" means the mechanism also known as knock-out.

"Manual feeding" means feeding wherein the material or part being processed is handled by the operator on each stroke of the press.

"Operator's station" means the complete complement of controls used by or available to an operator on a given operation for stroking the press.

"Part revolution clutch" means a type of clutch that can be disengaged at any point before the crankshaft has completed a full revolution and the press slide a full stroke.

"Pinch point" means any point other than the point of operation at which it is possible for a part of the body to be caught between the moving parts of a press or auxiliary equipment, or between moving and stationary parts of a press or auxiliary equipment or between the material and moving part or parts of the press or auxiliary equipment.

"Point of operation" means the area of the press where material is actually positioned and work is being performed during any process such as shearing, punching, forming, or assembling.

"Presence sensing device" means a device designed, constructed and arranged to create a sensing field or area that signals the clutch/brake control to deactivate the clutch and activate the brake of the press when any part of the operator's body or a hand tool is within such field or area.

"Presence sensing device initiation" means an operating mode of indirect manual initiation of a single stroke by a presence sensing device when it senses that work motions of the operator, related to feeding and/or removing parts, are completed and all parts of the operator's body or hand tools are safely clear of the point of operation.

"Press" means a mechanically powered machine that shears, punches, forms or assembles metal or other material by means of cutting, shaping, or combination dies attached to slides. A press consists of a stationary bed or anvil, and a slide (or slides) having a controlled reciprocating motion toward and away from the bed surface, the slide being guided in a definite path by the frame of the press.

"Pull-out device" means a mechanism attached to the operator's hands and connected to the upper die or slide of the press, that is designed, when properly adjusted, to withdraw the operator's hands as the dies close, if the operator's hands are inadvertently within the point of operation.

"Repeat" means an unintended or unexpected successive stroke of the press resulting from a malfunction.

"Safety block" means a prop that, when inserted between the upper and lower dies or between the bolster plate and the face of the slide, prevents the slide from falling of its own deadweight.

"Safety system" means the integrated total system, including the pertinent elements of the press, the controls, the safeguarding and any required supplemental safeguarding, and their interfaces with the operator, and the environment, designed, constructed, and arranged to operate together as a unit, such that a single failure or single operating error will not cause injury to personnel due to point of operation hazards.

"Semiautomatic feeding" means feeding wherein the material or part being processed is placed within or removed from the point of operation by an auxiliary means controlled by operator on each stroke of the press.

"Single stroke" means one complete stroke of the slide, usually initiated from a full open (or up) position, followed by closing, (or down), and then a return to the full open position.

"Single stroke mechanism" means an arrangement used on a full revolution clutch to limit the travel of the slide to one complete stroke at each engagement of the clutch.

"Slide" means the main reciprocating press member. A slide is also called a ram, plunger, or platen.

"Stop control" means an operator control designed to immediately deactivate the clutch control and activate the brake to stop slide motion.

"Stripper" means a mechanism or die part for removing the parts or material from the punch.

"Stroking selector" means the part of the clutch/brake control that determines the type of stroking when the operating means is actuated. The stroking selector generally

includes positions for "off" (clutch control), "inch," "single stroke," and "continuous" (when continuous is furnished).

"Sweep device" means a single or double arm (rod) attached to the upper die or slide of the press and designed to move the operator's hands to a safe position as the dies close, if the operator's hands are inadvertently within the point of operation.

"Trip or (tripping)" means activation of the clutch to "run" the press.

"Turnover bar" means a bar used in die setting to manually turn the crankshaft of the press.

"Two-hand control device" means a two-hand trip that further requires concurrent pressure from both hands of the operator during a substantial part of the die-closing portion of the stroke of the press.

"Two-hand trip" means a clutch actuating means requiring the concurrent use of both hands of the operator to trip the press.

"Unitized tooling" means a type of die in which the upper and lower members are incorporated into a self-contained unit so arranged as to hold the die members in alignment.

"Validation" or **"validate"** means for PSDI safety systems that a WISHA recognized third-party validation organization:

- For design certification/validation has reviewed the manufacturer's certification that the PSDI safety system meets the requirements of WAC 296-24-19503 through 296-24-19517 and WAC 296-24-20700 and the underlying tests and analyses performed by the manufacturer, has performed additional tests and analyses which may be required by WAC 296-24-19503 through 296-24-19517 and WAC 296-24-20700, and concludes that the requirements of WAC 296-24-19503 through 296-24-19517 and WAC 296-24-20700 have been met; and

- For installation certification/validation and annual recertification/revalidation has reviewed the employer's certification that the PSDI safety system meets the requirements of WAC 296-24-19503 through 296-24-19517 and WAC 296-24-20700 and the underlying tests performed by the employer, has performed additional tests and analyses which may be required by WAC 296-24-19503 through 296-24-19517 and WAC 296-24-20700, and concludes that the requirements of WAC 296-24-19503 through 296-24-19517 and WAC 296-24-20700 have been met.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-24-19501, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-24-19501, filed 7/20/94, effective 9/20/94; 88-23-054 (Order 88-25), § 296-24-19501, filed 11/14/88; Order 76-6, § 296-24-19501, filed 3/1/76; Order 73-5, § 296-24-19501, filed 5/9/73 and Order 73-4, § 296-24-19501, filed 5/7/73.]

WAC 296-24-19514 Reports of injuries to employees operating mechanical power presses. The employer shall, within thirty days of the occurrence, report to the Assistant Director, Department of Labor and Industries, Division of Consultation and Compliance, Post Office Box 44600, Olympia, Washington 98504-4600, all point of operation injuries to operators or other employees. The following information shall be included in the report:

(1) Employer's name, address and location of the workplace (establishment).

(2) Employee's name, injury sustained, and the task being performed (operation, set-up, maintenance, or other).

(3) Type of clutch used on the press (full revolution, part revolution, or direct drive).

(4) Type of safeguard(s) being used (two-hand control, two-hand trip, pull-outs, sweeps, or other). If the safeguard is not described in this section, give a complete description.

(5) Cause of the accident (repeat of press, safeguard failure, removing stuck part or scrap, no safeguard provided, no safeguard in use, or other).

(6) Type of feeding (manual with hands in dies or with hands out of dies, semiautomatic, automatic, or other).

(7) Means used to actuate press stroke (foot trip, foot control, hand trip, hand control, or other).

(8) Number of operators required for the operation and the number of operators provided with controls and safeguards.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-24-19514, filed 8/9/95, effective 9/25/95.]

WAC 296-24-19517 Presence sensing device initiation (PSDI). (1) General.

(a) The requirements of this section shall apply to all part revolution mechanical power presses used in the PSDI mode of operation.

(b) The relevant requirements of WAC 296-24-19503 through 296-24-19517 of this part also shall apply to all presses used in the PSDI mode of operation, whether or not cross referenced in this section. Such cross-referencing of specific requirements from WAC 296-24-19503 through 296-24-19517 of this part is intended only to enhance convenience and understanding in relating to the new provisions to the existing standard, and is not to be construed as limiting the applicability of other provisions in WAC 296-24-19503 through 296-24-19517 of this part.

(c) Full revolution mechanical power presses shall not be used in the PSDI mode of operation.

(d) Mechanical power presses with a configuration which would allow a person to enter, pass through, and become clear of the sensing field into the hazardous portion of the press shall not be used in the PSDI mode of operation.

(e) The PSDI mode of operation shall be used only for normal production operations. Die-setting and maintenance procedures shall comply with WAC 296-24-19503 through 296-24-19517 of this part, and shall not be done in the PSDI mode.

(2) Brake and clutch requirements.

(a) Presses with flexible steel band brakes or with mechanical linkage actuated brakes or clutches shall not be used in the PSDI mode.

(b) Brake systems on presses used in the PSDI mode shall have sufficient torque so that each average value of stopping times (Ts) for stops initiated at approximately forty-five degrees, sixty degrees, and ninety degrees, respectively, of crankshaft angular position, shall not be more than one hundred twenty-five percent of the average value of the stopping time at the top crankshaft position. Compliance with this requirement shall be determined by using the heaviest upper die to be used on the press, and operating at the fastest press speed if there is speed selection.

(c) Where brake engagement and clutch release is effected by spring action, such spring(s) shall operate in compression on a rod or within a hole or tube, and shall be of noninterleaving design.

(3) Pneumatic systems.

(a) Air valve and air pressure supply/control.

(i) The requirements of WAC 296-24-19505 (7)(m) and (n), (10), (12) and WAC 296-24-19507 (5)(c) of this part apply to the pneumatic systems of machines used in the PSDI mode.

(ii) The air supply for pneumatic clutch/brake control valves shall incorporate a filter, an air regulator, and, when necessary for proper operation, a lubricator.

(iii) The air pressure supply for clutch/brake valves on machines used in the PSDI mode shall be regulated to pressures less than or equal to the air pressure used when making the stop time measurements required by subsection (2)(b) of this section.

(b) Air counterbalance systems.

(i) Where presses that have slide counterbalance systems are used in the PSDI mode, the counterbalance system shall also meet the requirements of WAC 296-24-19505(9) of this part.

(ii) Counterbalances shall be adjusted in accordance with the press manufacturer's recommendations to assure correct counterbalancing of the slide attachment (upper die) weight for all operations performed on presses used in the PSDI mode. The adjustments shall be made before performing the stopping time measurements required by subsections (2)(b), (5)(c), and (9)(f) of this section.

(4) Flywheels and bearings. Presses whose designs incorporate flywheels running on journals on the crankshaft or back shaft, or bull gears running on journals mounted on the crankshaft, shall be inspected, lubricated, and maintained as provided in subsection (10) of this section to reduce the possibility of unintended and uncontrolled press strokes caused by bearing seizure.

(5) Brake monitoring.

(a) Presses operated in the PSDI mode shall be equipped with a brake monitor that meets the requirements of WAC 296-24-19505 (13) and (14). In addition, the brake monitor shall be adjusted during installation certification to prevent successive stroking of the press if increases in stopping time cause an increase in the safety distance above that required by subsection (9)(f) of this section.

(b) Once the PSDI safety system has been certified/validated, adjustment of the brake monitor shall not be done without prior approval of the validation organization for both the brake monitor adjustment and the corresponding adjustment of the safety distance. The validation organization shall in its installation validation, state that in what circumstances, if any, the employer has advance approval for adjustment, when prior oral approval is appropriate and when prior approval must be in writing. The adjustment shall be done under the supervision of an authorized person whose qualifications include knowledge of safety distance requirements and experience with the brake system and its adjustment. When brake wear or other factors extend press stopping time beyond the limit permitted by the brake monitor, adjustment, repair, or maintenance shall be per-

formed on the brake or other press system element that extends the stopping time.

(c) The brake monitor setting shall allow an increase of no more than ten percent of the longest stopping time for the press, or ten milliseconds, whichever is longer, measured at the top of the stroke.

(6) Cycle control and control systems.

(a) The control system on presses used in the PSDI mode shall meet the applicable requirements of WAC 296-24-19505 (7), (8), and (13) and 296-24-19507(5) of this part.

(b) The control system shall incorporate a means of dynamically monitoring for decoupling of the rotary position indicating mechanism drive from the crankshaft. This monitor shall stop slide motion and prevent successive press strokes if decoupling occurs, or if the monitor itself fails.

(c) The mode selection means of WAC 296-24-19505 (7)(c) of this part shall have at least one position for selection of the PSDI mode. Where more than one interruption of the light sensing field is used in the initiation of a stroke, either the mode selection means must have one position for each function, or a separate selection means shall be provided which becomes operable when the PSDI mode is selected. Selection of PSDI mode and the number of interruptions/withdrawals of the light sensing field required to initiate a press cycle shall be by means capable of supervision by the employer.

(d) A PSDI set-up/reset means shall be provided which requires an overt action by the operator, in addition to PSDI mode selection, before operation of the press by means of PSDI can be started.

(e) An indicator visible to the operator and readily seen by the employer shall be provided which shall clearly indicate that the system is set-up for cycling in the PSDI mode.

(f) The control system shall incorporate a timer to deactivate PSDI when the press does not stroke within the period of time set by the timer. The timer shall be manually adjustable, to a maximum time of thirty seconds. For any timer setting greater than fifteen seconds, the adjustment shall be made by the use of a special tool available only to authorized persons. Following a deactivation of PSDI by the timer, the system shall make it necessary to reset the set-up/reset means in order to reactivate the PSDI mode.

(g) Reactivation of PSDI operation following deactivation of the PSDI mode from any other cause, such as activation of the red color stop control required by WAC 296-24-19505 (7)(b) of this part, interruption of the presence sensing field, opening of an interlock, or reselection of the number of sensing field interruptions/withdrawals required to cycle the press, shall require resetting of the set-up/reset means.

(h) The control system shall incorporate an automatic means to prevent initiation or continued operation in the PSDI mode unless the press drive motor is energized in the forward direction of crankshaft rotation.

(i) The control design shall preclude any movement of the slide caused by operation of power on, power off, or selector switches, or from checks for proper operations as required by subdivision (m) of this subsection.

(j) All components and subsystems of the control system shall be designed to operate together to provide total control system compliance with the requirements of this section.

(k) Where there is more than one operator of a press used for PSDI, each operator shall be protected by a separate, independently functioning, presence sensing device. The control system shall require that each sensing field be interrupted the selected number of times prior to initiating a stroke. Further, each operator shall be provided with a set-up/reset means that meets the requirements of this subsection, and which must be actuated to initiate operation of the press in the PSDI mode.

(l) The control system shall incorporate interlocks for supplemental guards, if used, which will prevent stroke initiation or will stop a stroke in progress if any supplemental guard fails or is deactivated.

(m) The control system shall perform checks for proper operation of all cycle control logic element switches and contacts at least once each cycle. Control elements shall be checked for correct status after power "on" and before the initial PSDI stroke.

(n) The control system shall have provisions for an "inch" operating means meeting the requirements of WAC 296-24-19505 (7)(d) of this part. Die-setting shall not be done in the PSDI mode. Production shall not be done in the "inch" mode.

(o) The control system shall permit only a single stroke per initiation command.

(p) Controls with internally stored programs (e.g., mechanical, electro-mechanical, or electronic) shall meet the requirements of WAC 296-24-19505(13) of this part, and shall default to a predetermined safe condition in the event of any single failure within the system. Programmable controllers which meet the requirements for controls with internally stored programs stated above shall be permitted only if all logic elements affecting the safety system and point of operation safety are internally stored and protected in such a manner that they cannot be altered or manipulated by the user to an unsafe condition.

(7) Environmental requirements. Control components shall be selected, constructed, and connected together in such a way as to withstand expected operational and environmental stresses, at least including those outlined in WAC 296-24-20700. Such stresses shall not so affect the control system as to cause unsafe operation.

(8) Safety system.

(a) Mechanical power presses used in the PSDI mode shall be operated under the control of a safety system which, in addition to meeting the applicable requirements of WAC 296-24-19505(13) and 296-24-19507(5) and other applicable provisions of this part, shall function such that a single failure or single operating error shall not cause injury to personnel from point of operation hazards.

(b) The safety system shall be designed, constructed, and arranged as an integral total system, including all elements of the press, the controls, the safeguarding and any required supplemental safeguarding, and their interfaces with the operator and that part of the environment which has effect on the protection against point of operation hazards.

(9) Safeguarding the point of operation.

(a) The point of operation of presses operated in the PSDI mode shall be safeguarded in accordance with the

requirements of WAC 296-24-19507 of this part, except that the safety distance requirements of (f) of this subsection shall be used for PSDI operation.

(b) PSDI shall be implemented only by use of light curtain (photo-electric) presence sensing devices which meet the requirements of WAC 296-24-19507 (3)(c)(iii) of this part unless the requirements of (c) of this subsection have been met.

(c) Alternatives to photo-electric light curtains may be used for PSDI when the employer can demonstrate, through tests and analysis by the employer or the manufacturer, that the alternative is as safe as the photo-electric light curtain, that the alternative meets the conditions of this section, has the same long-term reliability as light curtains and can be integrated into the entire safety system as provided for in this section. Prior to use, both the employer and manufacturer must certify that these requirements and all the other applicable requirements of this section are met and these certifications must be validated by an OSHA-recognized third-party validation organization to meet these additional requirements and all the other applicable requirements of WAC 296-24-19503 through 296-24-19517 and 296-24-20700 of this part. Three months prior to the operation of any alternative system, the employer must notify the OSHA Directorate of Safety Standards Programs of the name of the system to be installed, the manufacturer and the OSHA-recognized third-party validation organization immediately. Upon request, the employer must make available to that office all tests and analyses for OSHA review.

(d) Individual sensing fields of presence sensing devices used to initiate strokes in the PSDI mode shall cover only one side of the press.

(e) Light curtains used for PSDI operation shall have minimum object sensitivity not to exceed one and one-fourth inches (31.75 mm). Where light curtain object sensitivity is user-adjustable, either discretely or continuously, design features shall limit the minimum object sensitivity adjustment not to exceed one and one-fourth inches (31.75 mm). Blanking of the sensing field is not permitted.

(f) The safety distance (Ds) from the sensing field of the presence sensing device to the point of operation shall be greater than or equal to the distance determined by the formula:

$$Ds = Hs(Ts + Tp + Tr + 2Tm) + Dp$$

Where:

Ds = Minimum safety distance.

Hs = Hand speed constant of sixty-three inches per second (1.6 m/s).

Ts = Longest press stopping time, in seconds, computed by taking averages of multiple measurements at each of three positions (forty-five degrees, sixty degrees, and ninety degrees) of crankshaft angular position; the longest of the three averages is the stopping time to use. (Ts is defined as the sum of the kinetic energy dissipation time plus the pneumatic/magnetic/hydraulic reaction time of the clutch/brake operating mechanism(s).)

Tp = Longest presence sensing device response time, in seconds.

Tr = Longest response time, in seconds, of all interposing control elements between the presence sensing device and the clutch/brake operating mechanism(s).

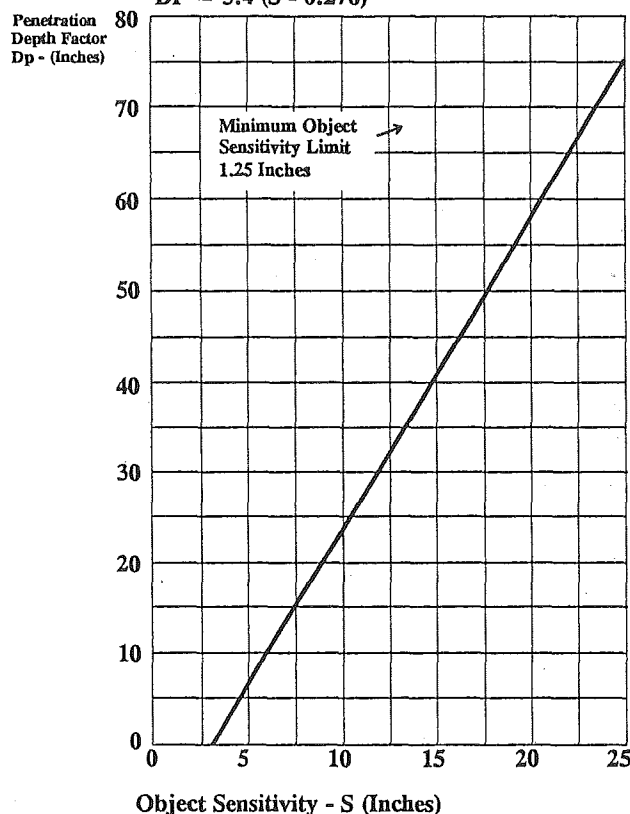
Tm = Increase in the press stopping time at the top of the stroke, in seconds, allowed by the brake monitor for brake wear. The time increase allowed shall be limited to no more than ten percent of the longest press stopping

time measured at the top of the stroke, or ten milliseconds, whichever is longer.

Dp=Penetration depth factor, required to provide for possible penetration through the presence sensing field by fingers or hand before detection occurs. The penetration depth factor shall be determined from Graph A-1 using the minimum object sensitivity size.

Penetration Depth Factor Calculation

$$DP = 3.4 (S - 0.276)$$



Object Sensitivity - S (Inches)

(g) The presence sensing device location shall either be set at each tool change and set-up to provide at least the minimum safety distance, or fixed in location to provide a safety distance greater than or equal to the minimum safety distance for all tooling set-ups which are to be used on that press.

(h) Where presence sensing device location is adjustable, adjustment shall require the use of a special tool available only to authorized persons.

(i) Supplemental safeguarding shall be used to protect all areas of access to the point of operation which are unprotected by the PSDI presence sensing device. Such supplemental safeguarding shall consist of either additional light curtain (photo-electric) presence sensing devices or other types of guards which meet the requirements of WAC 296-24-19507 and 296-24-19517 of this part.

(i) Presence sensing devices used as supplemental safeguarding shall not initiate a press stroke, and shall conform to the requirements of WAC 296-24-19507 (3)(c) and other applicable provisions of this part, except that the safety distance shall comply with (f) of this subsection.

(ii) Guards used as supplemental safeguarding shall conform to the design, construction and application requirements of WAC 296-24-19507(2) of this part, and shall be interlocked with the press control to prevent press PSDI operation if the guard fails, is removed, or is out of position.

(j) Barriers shall be fixed to the press frame or bolster to prevent personnel from passing completely through the sensing field, where safety distance or press configuration is such that personnel could pass through the PSDI presence sensing field and assume a position where the point of operation could be accessed without detection by the PSDI presence sensing device. As an alternative, supplemental presence sensing devices used only in the safeguard mode may be provided. If used, these devices shall be located so as to detect all operator locations and positions not detected by the PSDI sensing field, and shall prevent stroking or stop a stroke in process when any supplemental sensing field(s) are interrupted.

(k) Hand tools. Where tools are used for feeding, removal of scrap, lubrication of parts, or removal of parts that stick on the die in PSDI operations:

(i) The minimum diameter of the tool handle extension shall be greater than the minimum object sensitivity of the presence sensing device(s) used to initiate press strokes; or

(ii) The length of the hand tool shall be such as to ensure that the operator's hand will be detected for any safety distance required by the press set-ups.

(10) Inspection and maintenance.

(a) Any press equipped with presence sensing devices for use in PSDI, or for supplemental safeguarding on presses used in the PSDI mode, shall be equipped with a test rod of diameter specified by the presence sensing device manufacturer to represent the minimum object sensitivity of the sensing field. Instructions for use of the test rod shall be noted on a label affixed to the presence sensing device.

(b) The following checks shall be made at the beginning of each shift and whenever a die change is made.

(i) A check shall be performed using the test rod according to the presence sensing device manufacturer's instructions to determine that the presence sensing device used for PSDI is operational.

(ii) The safety distance shall be checked for compliance with subsection (9)(f) of this section.

(iii) A check shall be made to determine that all supplemental safeguarding is in place. Where presence sensing devices are used for supplemental safeguarding, a check for proper operation shall be performed using a test rod according to the presence sensing device manufacturer's instructions.

(iv) A check shall be made to assure that the barriers and/or supplemental presence sensing devices required by subsection (9)(j) of this section are operating properly.

(v) A system or visual check shall be made to verify correct counterbalance adjustment for die weight according to the press manufacturer's instructions, when a press is equipped with a slide counterbalance system.

(c) When presses used in the PSDI mode have flywheel or bullgear running on crankshaft mounted journals and bearings, or a flywheel mounted on back shaft journals and bearings, periodic inspections following the press manufacturer's recommendations shall be made to ascertain that bearings are in good working order, and that automatic lubrication systems for these bearings (if automatic lubrication is provided) are supplying proper lubrication. On presses with provision for manual lubrication of flywheel or

bullgear bearings, lubrication shall be provided according to the press manufacturer's recommendations.

(d) Periodic inspections of clutch and brake mechanisms shall be performed to assure they are in proper operating condition. The press manufacturer's recommendations shall be followed.

(e) When any check of the press, including those performed in accordance with the requirements of (b), (c), or (d) of this subsection, reveals a condition of noncompliance, improper adjustment, or failure, the press shall not be operated until the condition has been corrected by adjustment, replacement, or repair.

(f) It shall be the responsibility of the employer to ensure the competence of personnel caring for, inspecting, and maintaining power presses equipped for PSDI operation, through initial and periodic training.

(11) Safety system certification/validation.

(a) Prior to the initial use of any mechanical press in the PSDI mode, two sets of certification and validation are required:

(i) The design of the safety system required for the use of a press in the PSDI mode shall be certified and validated prior to installation. The manufacturer's certification shall be validated by an OSHA-recognized third-party validation organization to meet all applicable requirements of WAC 296-24-19503 through 296-24-19517 and 296-24-20700 of this part.

(ii) After a press has been equipped with a safety system whose design has been certified and validated in accordance with (a) of this subsection, the safety system installation shall be certified by the employer, and then shall be validated by an OSHA-recognized third-party validation organization to meet all applicable requirements of WAC 296-24-19503 through 296-24-19517 and 296-24-20700 of this part.

(b) At least annually thereafter, the safety system on a mechanical power press used in the PSDI mode shall be recertified by the employer and revalidated by an OSHA-recognized third-party validation organization to meet all applicable requirements of WAC 296-24-19503 through 296-24-19517 and 296-24-20700 of this part. Any press whose safety system has not been recertified and revalidated within the preceding twelve months shall be removed from service in the PSDI mode until the safety system is recertified and revalidated.

(c) A label shall be affixed to the press as part of each installation certification/validation and the most recent recertification/revalidation. The label shall indicate the press serial number, the minimum safety distance (Ds) required by subsection (9)(f) of this section, the fulfillment of design certification/validation, the employer's signed certification, the identification of the OSHA-recognized third-party validation organization, its signed validation, and the date the certification/validation and recertification/revalidation are issued.

(d) Records of the installation certification and validation and the most recent recertification and revalidation shall be maintained for each safety system equipped press by the employer as long as the press is in use. The records shall include the manufacture and model number of each component and subsystem, the calculations of the safety distance as required by subsection (9)(f) of this section, and the stopping

time measurements required by subsection (2)(b) of this section. The most recent records shall be made available to OSHA/WISHA upon request.

(e) The employer shall notify the OSHA-recognized third-party validation organization within five days whenever a component or a subsystem of the safety system fails or modifications are made which may affect the safety of the system. The failure of a critical component shall necessitate the removal of the safety system from service until it is recertified and revalidated, except recertification by the employer without revalidation is permitted when a noncritical component or subsystem is replaced by one of the same manufacture and design as the original, or determined by the third-party validation organization to be equivalent by similarity analysis, as set forth in WAC 296-24-20700.

(f) The employer shall notify the OSHA-recognized third-party validation organization within five days of the occurrence of any point of operation injury while a press is used in the PSDI mode. This is in addition to the report of injury required by WAC 296-24-19517; however, a copy of that report may be used for this purpose.

(12) Die setting and work set-up.

(a) Die setting on presses used in the PSDI mode shall be performed in accordance with WAC 296-24-19509.

(b) The PSDI mode shall not be used for die setting or set-up. An alternative manual cycle initiation and control means shall be supplied for use in die setting which meets the requirements of WAC 296-24-19505(7).

(c) Following a die change, the safety distance, the proper application of supplemental safeguarding, and the slide counterbalance adjustment (if the press is equipped with a counterbalance) shall be checked and maintained by authorized persons whose qualifications include knowledge of the safety distance, supplemental safeguarding requirements, and the manufacturer's specifications for counterbalance adjustment. Adjustment of the location of the PSDI presence sensing device shall require use of a special tool available only to the authorized persons.

(13) Operator training.

(a) The operator training required by WAC 296-24-19513(2) shall be provided to the employee before the employee initially operates the press and as needed to maintain competence, but not less than annually thereafter. It shall include instruction relative to the following items for presses used in the PSDI mode.

(i) The manufacturer's recommended test procedures for checking operation of the presence sensing device. This shall include the use of the test rod required by subsection (10)(a) of this section.

(ii) The safety distance required.

(iii) The operation, function, and performance of the PSDI mode.

(iv) The requirements for handtools that may be used in the PSDI mode.

(v) The severe consequences that can result if the operator attempts to circumvent or by-pass any of the safeguard or operating functions of the PSDI system.

(b) The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the training was completed. The certification record shall be

prepared at the completion of training and shall be maintained on file for the duration of the employee's employment. The certification record shall be made available upon request to the Assistant Secretary for Occupational Safety and Health or the designated representative of the director.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-24-19517, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-24-19517, filed 7/20/94, effective 9/20/94; 92-17-022 (Order 92-06), § 296-24-19517, filed 8/10/92, effective 9/10/92; 88-23-054 (Order 88-25), § 296-24-19517, filed 11/14/88.]

WAC 296-24-33003 Scope. This section applies to the handling, storage, and use of flammable and combustible liquids with a flash point below 200°F. This section does not apply to:

(1) Bulk transportation of flammable and combustible liquids;

(2) Storage, handling, and use of fuel oil tanks and containers connected with oil burning equipment;

(3) Storage of flammable and combustible liquids on farms.

(4) Liquids without flashpoints that may be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons;

(5) Mists, sprays, or foams, except flammable aerosols covered in WAC 296-24-33009; or

(6) Installations made in accordance with requirements of the following standards:

(a) National Fire Protection Association Standard for Drycleaning Plants, NFPA No. 32-1970;

(b) National Fire Protection Association Standard for the Manufacture of Organic Coatings, NFPA No. 35-1970;

(c) National Fire Protection Association Standard for Solvent Extraction Plants, NFPA No. 36-1967; or

(d) National Fire Protection Association Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, NFPA No. 37-1970.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-24-33003, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 94-06-068 (Order 93-17), § 296-24-33003, filed 3/2/94, effective 3/1/95; Order 73-5, § 296-24-33003, filed 5/9/73 and Order 73-4, § 296-24-33003, filed 5/7/73.]

WAC 296-24-58503 Scope, application and definitions applicable. (1) Scope. This section contains requirements for fire brigades, and all portable and fixed fire suppression equipment, fire detection systems, and fire or employee alarm systems installed to meet the fire protection requirements of this chapter.

(2) Application. This section applies to all employments except for maritime, construction and agriculture.

(3) Definitions applicable to this section.

(a) "After-flame," means the time a test specimen continues to flame after the flame source has been removed.

(b) "Aqueous film forming foam (AFFF)," means a fluorinated surfactant with a foam stabilizer which is diluted with water to act as a temporary barrier to exclude air from mixing with the fuel vapor by developing an aqueous film on the fuel surface of some hydrocarbons which is capable of suppressing the generation of fuel vapors.

(c) "Approved," means acceptable to the director under the following criteria:

(i) If it is accepted, or certified, or listed, or labeled or otherwise determined to be safe by a nationally recognized testing laboratory; or

(ii) With respect to an installation or equipment of a kind which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another federal agency and found in compliance with the provisions of the applicable National Fire Protection Association Fire Code; or

(iii) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director; and

(iv) For the purposes of (c) of this subsection:

(A) Equipment is listed if it is of a kind mentioned in a list which is published by a nationally recognized testing laboratory which makes periodic inspections of the production of such equipment and which states that such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner;

(B) Equipment is labeled if there is attached to it a label, symbol, or other identifying mark of a nationally recognized testing laboratory which makes periodic inspections of the production of such equipment and whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner;

(C) Equipment is accepted if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes;

(D) Equipment is certified if it has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner or is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and if it bears a label, tag, or other record of certification; and

(E) Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(d) "Automatic fire detection device," means a device designed to automatically detect the presence of fire by heat, flame, light, smoke or other products of combustion.

(e) "Buddy-breathing device," means an accessory to self-contained breathing apparatus which permits a second person to share the same air supply as that of the wearer of the apparatus.

(f) "Carbon dioxide," means a colorless, odorless, electrically nonconductive inert gas (chemical formula CO₂) that is a medium for extinguishing fires by reducing the concentration of oxygen or fuel vapor in the air to the point where combustion is impossible.

(g) "Class A fire," means a fire involving ordinary combustible materials such as paper, wood, cloth, and some rubber and plastic materials.

(h) "Class B fire," means a fire involving flammable or combustible liquids, flammable gases, greases and similar materials, and some rubber and plastic materials.

(i) "Class C fire," means a fire involving energized electrical equipment where safety to the employee requires the use of electrically nonconductive extinguishing media.

(j) "Class D fire," means a fire involving combustible metals such as magnesium, titanium, zirconium, sodium, lithium and potassium.

(k) "Dry chemical," means an extinguishing agent composed of very small particles of chemicals such as, but not limited to, sodium bicarbonate, potassium bicarbonate, urea-based potassium bicarbonate, potassium chloride, or monoammonium phosphate supplemented by special treatment to provide resistance to packing and moisture absorption (caking) as well as to provide proper flow capabilities. Dry chemical does not include dry powders.

(l) "Dry powder," means a compound used to extinguish or control Class D fires.

(m) "Education," means the process of imparting knowledge or skill through systematic instruction. It does not require formal classroom instruction.

(n) "Enclosed structure," means a structure with a roof or ceiling and at least two walls which may present fire hazards to employees, such as accumulations of smoke, toxic gases and heat similar to those found in buildings.

(o) "Extinguisher classification," means the letter classification given an extinguisher to designate the class or classes of fire on which an extinguisher will be effective.

(p) "Extinguisher rating," means the numerical rating given to an extinguisher which indicates the extinguishing potential of the unit based on standardized tests developed by Underwriters' Laboratories, Inc.

(q) "Fire brigade," (private fire department, industrial fire department) means an organized group of employees who are knowledgeable, trained, and skilled in at least basic fire fighting operations.

(r) "Fixed extinguishing system," means a permanently installed system that either extinguishes or controls a fire at the location of the system.

(s) "Flame resistance," is the property of materials, or combinations of component materials, to retard ignition and restrict the spread of flame.

(t) "Foam," means a stable aggregation of small bubbles which flow freely over a burning liquid surface and form a coherent blanket which seals combustible vapors and thereby extinguishes the fire.

(u) "Gaseous agent," is a fire extinguishing agent which is in the gaseous state at normal room temperature and pressure. It has low viscosity, can expand or contract with changes in pressure and temperature, and has the ability to diffuse readily and to distribute itself uniformly throughout an enclosure.

(v) "Halon 1211," means a colorless, faintly sweet smelling, electrically nonconductive liquefied gas (chemical formula CBrClF_2) which is a medium for extinguishing fires by inhibiting the chemical chain reaction of fuel and oxygen. It is also known as bromochlorodifluoromethane.

(w) "Halon 1301," means a colorless, odorless, electrically nonconductive gas (chemical formula CBrF_3) which is a medium for extinguishing fires by inhibiting the chemical chain reaction of fuel and oxygen. It is also known as bromotrifluoromethane.

(x) "Helmet," is a head protective device consisting of a rigid shell, energy absorption system and chin strap

intended to be worn to provide protection for the head or portions thereof, against impact, flying or falling objects, electric shock, penetration, heat and flame.

(y) "Incipient stage fire," means a fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.

(z) "Inspection," means a visual check of fire protection systems and equipment to ensure that they are in place, charged, and ready for use in the event of a fire.

(aa) "Interior structural fire fighting," means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage.

(bb) "Lining," means a material permanently attached to the inside of the outer shell of a garment for the purpose of thermal protection and padding.

(cc) "Local application system," means a fixed fire suppression system which has a supply of extinguishing agent, with nozzles arranged to automatically discharge extinguishing agent directly on the burning material to extinguish or control a fire.

(dd) "Maintenance," means the performance of services on fire protection equipment and systems to assure that they will perform as expected in the event of a fire. Maintenance differs from inspection in that maintenance requires the checking of internal fitting, devices and agent supplies.

(ee) "Multipurpose dry chemical," means a dry chemical which is approved for use on Class A, Class B and Class C fires.

(ff) "Outer shell," is the exterior layer of material on the fire coat and protective trousers which forms the outermost barrier between the fire fighter and the environment. It is attached to the vapor barrier and liner and is usually constructed with a storm flap, suitable closures, and pockets.

(gg) "Positive-pressure breathing apparatus," means self-contained breathing apparatus in which the pressure in the breathing zone is positive in relation to the immediate environment during inhalation and exhalation.

(hh) "Predischage employee alarm," means an alarm which will sound at a set time prior to actual discharge of an extinguishing system so that employees may evacuate the discharge area prior to system discharge.

(ii) "Quick disconnect valve," means a device which starts the flow of air by inserting of the hose (which leads from the facepiece) into the regulator of self-contained breathing apparatus, and stops the flow of air by disconnection of the hose from the regulator.

(jj) "Sprinkler alarm," means an approved device installed so that any waterflow from a sprinkler system equal to or greater than that from single automatic sprinkler will result in an audible alarm signal on the premises.

(kk) "Sprinkler system," means a system of piping designed in accordance with fire protection engineering standards and installed to control or extinguish fires. The system includes an adequate and reliable water supply, and a network of specially sized piping and sprinklers which are interconnected. The system also includes a control valve and a device for actuating an alarm when the system is in operation.

(ll) "Standpipe systems:"

(i) "Class I standpipe system," means a two and one-half-inch (6.3 cm) hose connection for use by fire departments and those trained in handling heavy fire streams.

(ii) "Class II standpipe system," means a one and one-half-inch (3.8 cm) hose system which provides a means for the control or extinguishment of incipient stage fires.

(iii) "Class III standpipe system," means a combined system of hose which is for the use of employees trained in the use of hose operations and which is capable of furnishing effective water discharge during the more advanced stages of fire (beyond the incipient stage) in the interior of workplaces. Hose outlets are available for both one and one-half-inch (3.8 cm) and two and one-half-inch (6.3 cm) hose.

(iv) "Small hose system," means a system of hose ranging in diameter from five-eighths-inch (1.6 cm) up to one and one-half-inch (3.8 cm) which is for the use of employees and which provides a means for the control and extinguishment of incipient stage fires.

(mm) "Total flooding system," means a fixed suppression system which is arranged to automatically discharge a predetermined concentration of agent into an enclosed space for the purpose of fire extinguishment or control.

(nn) "Training," means the process of making proficient through instruction and hands-on practice in the operation of equipment, including respiratory protection equipment, that is expected to be used in the performance of assigned duties.

(oo) "Vapor barrier," means that material used to prevent or substantially inhibit the transfer of water, corrosive liquids and steam or other hot vapors from the outside of a garment to the wearer's body.

Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-24-58503, filed 10/20/95, effective 1/16/96. [Statutory Authority: Chapter 49.17 RCW. 94-06-068 (Order 93-17), § 296-24-58503, filed 3/2/94, effective 3/1/95; 88-23-054 (Order 88-25), § 296-24-58503, filed 11/14/88; 87-24-051 (Order 87-24), § 296-24-58503, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-02-003 (Order 81-32), § 296-24-58503, filed 12/24/81.]

WAC 296-24-73501 General requirements. This section applies to all permanent places of employment, except where domestic, mining, or agricultural work only is performed. Construction work is not to be deemed as a permanent place of employment. Measures for the control of toxic materials are considered to be outside the scope of this section.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-24-73501, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 94-06-068 (Order 93-17), § 296-24-73501, filed 3/2/94, effective 3/1/95; Order 73-5, § 296-24-73501, filed 5/9/73 and Order 73-4, § 296-24-73501, filed 5/7/73.]

Chapter 296-30 WAC

RULES FOR THE ADMINISTRATION OF THE CRIME VICTIM COMPENSATION PROGRAM

WAC

296-30-025 Medical assistance eligibility.
296-30-081 Acceptance of rules and fees for medical and mental health services.

WAC 296-30-025 Medical assistance eligibility. The benefits provided under chapter 7.68 RCW that are available

and equivalent to those services provided under chapter 74.09 RCW or Title XIX of the Federal Social Security Act are not available to persons eligible for services provided under chapter 74.09 RCW or Title XIX of the Federal Social Security Act, except to the extent that costs for such services exceed service limits established by the department of social and health services. Accordingly:

(1) Applicants for benefits provided under chapter 7.68 RCW shall provide, concurrent with their application for crime victims' benefits, information requested by the department to determine the applicant's probable eligibility for services provided under chapter 74.09 RCW and Title XIX of the Federal Social Security Act. The applicant, or a person on behalf of the applicant, shall send the application and other requested information to the offices of the crime victims' compensation program in Olympia.

(2) The department shall provide application forms for crime victims' benefits, any forms used to determine probable eligibility for services provided under chapter 74.09 RCW or Title XIX of the Federal Social Security Act, and a pamphlet describing the crime victims' compensation program to hospitals, law enforcement agencies, community organizations, prosecutor based victim/witness units and, as requested, to other service groups. The pamphlet shall (a) explain the limitations of benefits provided under chapter 7.68 RCW; (b) provide assistance for an applicant in completing the forms; and (c) provide an applicant information about where additional assistance is available if the instructions for completing the forms are not understood or if unusual circumstances exist.

(3) Any claimant who is eligible for benefits provided under chapter 7.68 RCW and who the department determines may be eligible for services provided under chapter 74.09 RCW and Title XIX of the Federal Social Security Act, based upon the completed eligibility form referenced above, shall apply to the department of social and health services for a conclusive determination of eligibility for such services.

(4) The department shall not provide benefits for services provided under chapter 74.09 RCW and Title XIX of the Federal Social Security Act to persons who refuse or who otherwise fail to cooperate or comply in good faith with the requirements of this section, except to the extent that the costs for such services exceed service limits established by the department of social and health services.

(5) Except for claims submitted pursuant to RCW 7.68.170 for sexual assault examinations, the department shall not consider applications for benefits under chapter 7.68 RCW until the information requested to determine probable eligibility for services provided under chapter 74.09 RCW and Title XIX of the Federal Social Security Act is received by the department.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-30-025, filed 7/5/95, effective 8/5/95. Statutory Authority: RCW 7.68.030, 7.68.070 (12) and (16) and 51.04.030. 89-23-004, § 296-30-025, filed 11/3/89, effective 11/10/89.]

WAC 296-30-081 Acceptance of rules and fees for medical and mental health services. Providing medical or counseling services to an injured crime victim whose claim for crime victims compensation benefits has been accepted

by the department constitutes acceptance of the department's medical aid rules and compliance with its rules and fees. Maximum allowable fees shall be those fees contained in the publications entitled *Medical Aid Rules and Fee Schedules and Crime Victims Compensation Program Mental Health Treatment Rules and Fees*, less any available benefits of public or private collateral resources, except as follows:

The percentage of allowed charges authorized by WAC 296-23A-105: Payment for hospital inpatient and outpatient services, WAC 296-23A-155: New hospitals, WAC 296-23A-160(3): Excluded and included services, and WAC 296-23A-165: Out-of-state hospitals shall be equal to the percentage of allowed charges established by the department of social and health services under Title 74 RCW and WAC 388-87-070(6): Payment hospital inpatient services.

If any of the maximum allowable fees in the publications entitled *Medical Aid Rules and Fee Schedules and Crime Victims Compensation Program Mental Health Treatment Rules and Fees* is lower than the maximum allowable fees for those procedures established by the department of social and health services under Title 74 RCW, the Title 74 RCW fees are the maximum allowable fees for those procedures.

Prior to the establishment or amendment of the fee schedules, the department will give at least thirty calendar days notice by mail to interested persons who have made timely request for advance notice of the establishment or amendment of the fee schedules. To request advance notice of the establishment or amendment of the medical fee schedules, interested persons must contact the department at the following address:

Department of Labor and Industries
Health Services Analysis
P.O. Box 44322
Olympia, WA 98504-4322

To request advance notice of the establishment or amendment of the mental health fee schedules, interested persons must contact the department at the following address:

Department of Labor and Industries
Crime Victims Compensation Section
P.O. Box 44520
Olympia, WA 98504-4520

An injured victim shall not be billed for his or her accepted injury. The department shall be billed only after available benefits of public or private insurance have been determined. Bills must be submitted within ninety days from the date of service to be considered for payment. If insurance or public agency collateral resources exist, bills must be received within ninety days following payment or rejection by the resource. A copy of the payment or rejection must accompany the bill.

If the service provider has billed the injured victim and is later notified that the department has accepted the victim's claim, the provider shall refund to the injured victim any amounts paid that are in excess of the amounts that the victim is entitled to from public or private insurers, and bill the department for services rendered at their usual and customary fees if such rates are in excess of the public or private insurance entitlements.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-30-081, filed 7/5/95, effective 8/5/95. Statutory Authority: Chapter 7.68 RCW. 94-02-015, § 296-30-081, filed 12/23/93, effective 1/24/94; 92-23-034, § 296-30-081, filed 11/13/92, effective 12/14/92; 92-16-033, § 296-30-081, filed 7/30/92, effective 8/30/92; 86-01-028 (Order 85-37), § 296-30-081, filed 12/11/85.]

Chapter 296-31 WAC

CRIME VICTIMS COMPENSATION MENTAL HEALTH TREATMENT RULES AND FEES

WAC

296-31-010	Mental health treatment overview.
296-31-020	Definitions.
296-31-030	General provider requirements—Who may treat.
296-31-050	Initial treatment and application for benefits.
296-31-060	Reporting requirements.
296-31-065	Ongoing treatment.
296-31-069	Independent assessments.
296-31-070	Provider obligations—Acceptance of rules and fees.
296-31-075	Excess recoveries.
296-31-080	Billing procedures.
296-31-090	Mental health fees.

WAC 296-31-010 Mental health treatment overview. (1) The crime victim compensation program provides mental health treatment to victims of crime, except for the provisions of WAC 296-30-025 (6)(b), secondary to treatment available from any other public or private insurance, who are eligible for compensation under the provisions of chapter 7.68 RCW. Eligible claimants are entitled to receive proper and necessary mental health treatment.

(2) Services and treatment are limited to those procedures which are proper and necessary, and at the least cost, consistent with accepted standards of mental health care which will enable the claimant to obtain maximum recovery and/or:

(3) In the case of a permanent partial disability, treatment or services are not to extend beyond the date when permanent partial impairment or disability compensation is awarded. No treatment or services will be authorized beyond the point that the accepted condition is fixed and stable.

(4) In the case of a permanent total disability, treatment is not to extend beyond the date on which the claimant is placed upon a permanent pension roll except that in the sole discretion of the department continued treatment for conditions previously accepted by the department may be allowed when such treatment is deemed necessary to protect the claimant's life or to provide for the administration of therapeutic measures. This includes payment of prescription medications necessary to alleviate continuing pain resulting from the accepted condition but does not include those controlled substances scheduled by the state board of pharmaceuticals as schedule I, II, III, IV substances under chapter 69.50 RCW.

(5) Mental health treatment requiring preauthorization:
Inpatient hospitalization;
Individual therapy exceeding one hour per week;
Group therapy exceeding one session per week;
Concurrent treatment;
Family therapy (including all therapy provided to family members) beyond twelve sessions;

Therapy for survivors of victims of homicide beyond twelve sessions;

Electroconvulsive therapy;

Neuropsychological evaluation (testing);

Day treatment for seriously ill persons less than eighteen years of age;

Referrals to special programs.

Requests for authorization must be in writing and include a statement of:

(a) The condition(s) diagnosed;

(b) ICD-9-CM and/or DSM-III-R or DSM-IV codes;

(c) The relationship of the condition(s) diagnosed to the assault, if any;

(d) An outline of the proposed treatment program, its length and components, procedure codes, and expected prognosis.

(6) Rejected and closed claims. Therapy for eligible survivors of victims of homicide can be provided on closed claims:

No payment will be made for treatment or medication on rejected claims or for services rendered after the date of closure of a claim.

When the department has denied responsibility for an alleged crime victim injury or condition, the only services which will be paid are those which were carried out at the specific request of the department and/or those assessment or diagnostic services which served as a basis for the adjudication decision. Following the date of the order and notice of claim closure, the department will be responsible only for those services specifically requested or those assessments and/or diagnostic services necessary to complete and file a reopening application.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-010, filed 7/5/95, effective 8/5/95. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-010, filed 11/13/92, effective 12/14/92.]

WAC 296-31-020 Definitions. This section explains the department's definitions of terms used throughout the sections as they apply to claimants.

Acceptance, accepted condition: Determination, in writing, by a qualified representative of the department, that reimbursement for the diagnosis and rehabilitative treatment of a claimant's mental health condition are the responsibility of the department. The condition being accepted must be specified by one or more diagnostic codes from the current edition of the International Classification of Diseases, Clinically Modified (ICD-CM), or by DSM III-R, or DSM IV and by use of words to describe the symptoms connected to or citing ICD-CM or DSM III-R or DSM IV diseases.

Authorization: Notification, in writing or by telephone, by a qualified representative of the department, that specific necessary treatment, services, or equipment recommended by a provider for the diagnosis or rehabilitative treatment of an accepted condition will be reimbursed by the department. Providers must insure they maintain records indicating the name of the qualified representative who authorizes treatment or equipment.

Claimant: A person who submits, or on whose behalf is submitted, an application for benefits under the Crime Victims Act.

Consultation: The services rendered by a mental health provider whose opinion or advice is requested by the attending (treating) mental health provider, or agency, or by the department in the evaluation and/or treatment of a claimant. Case management or case staffing does not constitute a consultation. Treatment of a claimant is not a consultation.

Crisis intervention: Therapy to alleviate the most pressing problems and attempt to use the crisis as an opportunity for positive change; the vital mental and safety functions of the client are stabilized by providing support, structure and, if necessary, restraint.

Disability awards for mental health conditions: Direct monetary compensation that may be provided to an eligible claimant who is either totally temporarily disabled, permanently partially disabled, or totally permanently disabled resulting from an accepted condition. Under Washington law, permanent disability awards are based solely on mental impairment due to the accepted injury or conditions without consideration of economic factors. Disability rating exams must be provided by a physician.

Elective nonemergent hospital admission: Placement of the claimant in an acute care hospital or residential treatment facility for mental health treatment of a claim related mental health condition which may be safely scheduled in advance without jeopardizing the claimant's health or treatment outcome.

Emergent hospital admission: Placement of the claimant in an acute care hospital, psychiatric hospital, or residential treatment facility for treatment of a claim related mental health condition of an unforeseen or rapidly progressing nature which, if not treated in an inpatient setting, is likely to jeopardize the claimant's health or treatment outcome.

Family therapy: Therapy involving the therapist, and one or more members of the claimant's family (excluding the perpetrator if also a family member) and which centers on issues resulting from the claimant's sexual assault pursuant to WAC 296-30-080.

Group therapy: Therapy involving the claimant, the therapist, and one or more clients who are not related to the claimant and which includes issues both related to the claimant's assault and pertinent to other group members, not necessarily related to the claimant's assault.

Homicide survivor: An immediate family member of a homicide victim as the result of a criminal act committed on or after July 1, 1992. Homicide survivors may receive appropriate counseling to assist them with the immediate, near term consequences of the related effects of the homicide. Family members applying for survivor counseling benefits must complete and submit a Request for Homicide Survivor Counseling Benefits Form (F800-057-000) once a claim has been established and allowed by the department. Maximum allowable fees shall be those fees contained in the publication entitled *Crime Victims Compensation Program Mental Health Treatment Rules and Fees*, less any benefits of public or private collateral resources available to each eligible family member.

Immediate family members: Any claimant's parents, spouse, child(ren), siblings, grandparents, and those members of the same household who have assumed the rights and

duties commonly associated with a family and who hold themselves out as a family unit.

Individual therapy: Therapy provided on a one to one basis between a therapist and claimant.

Mental health services provider: Any person, firm, corporation, partnership, association, agency, institution, or other entity providing any kind of mental health services related to the treatment of a claimant. This includes, but is not limited to, hospitals, psychiatrists, psychologists, advanced registered nurse practitioners with a specialty in psychiatric and mental health nursing, registered and/or certified master level counselors, and other qualified service providers licensed, registered and/or certified with the department of health and registered with the crime victims program. (Refer to WAC 296-31-030 for specific details.)

Modified work status: When the claimant is not able to return to previous work, but is capable of carrying out work of a lighter, or otherwise different nature.

Necessary treatment: Those health services or treatments which, in the opinion of the director or his or her designee are:

Proper and necessary for the diagnosis or rehabilitative treatment of an accepted condition;

Reflective of accepted standards of good practice within the scope of the provider's license, certification, or registration;

Not delivered primarily for the convenience of the claimant, the claimant's attending provider, or any other provider; and

Provided at the least cost and in the least intensive setting of care consistent with accepted standards of care/accepted therapeutic practice and with the other provisions of this definition. Services which are inappropriate to the accepted condition, or which present hazards in excess of the expected mental health benefits, are not considered necessary. Services which are obsolete are not authorized. Services which are controversial, experimental, or investigational are presumed not to be consistent with accepted standards of care and shall only be authorized on an individual case basis with written authorization for the service from the department.

Office notes: Written records of treatment, or other work products, documenting specific charges billed, as opposed to reports of evaluation and progress independently submitted to the department or to other parties.

Permanent partial disability: Providers are required to notify the department of any claimant's accepted condition where permanent functional impairment or loss is indicated after maximum rehabilitation has been achieved, which is determined to be stable and fixed at the time the evaluation is made. The department will arrange to have impairments rated using the category system under WAC 296-20-200 et al.

Regular work status: When the injured claimant is capable of returning to his/her regular work, the attending provider must notify the claimant and the department of the specific date of release to return to regular work. Time loss compensation will be terminated on the release date. Further treatment may be allowed as requested by the attending provider if the condition is not stable or fixed and treatment is needed for the accepted condition.

Repressed memory: A condition of not having or had conscious memory of an act. For the purpose of these rules describing this condition under this section the definition means that a claimant regained conscious memory of victimization caused by a criminal act committed against them as a minor.

Temporary partial disability: Partial time loss may be paid when the claimant can return to work on a limited basis, or, return to a lesser paying job is necessitated by the accepted condition. However, the claimant must have a reduction in wages of at least five percent before loss of earning power can be paid.

Termination of treatment: When treatment is no longer required because the accepted condition for which the claim was allowed has become stable, the provider must submit a report indicating the date the condition became stable to the department. This is necessary to initiate closure of the crime victim's compensation claim.

Time loss certification: Certification from a physician based upon findings which are specific symptoms that an accepted condition of a claimant either partially or totally incapacitates the claimant from returning to work. Such symptoms may include, but are not limited to: Anxiety, depression, loss of appetite, weight loss, flat affect, inability to concentrate, inability to complete tasks. The department requires that all claims for time loss compensation must be certified by a physician.

Total permanent disability: A condition permanently incapacitating a claimant from performing any work at any gainful occupation.

Total temporary disability (time loss): The claimant is temporarily unable to return to any type of reasonably continuous gainful employment as a direct result of an accepted condition. Time loss compensation will be paid if the victim was employed on the date of their criminal injury, or, if not, if the victim was employed three or more consecutive months during the twelve months immediately preceding the date of the assault.

Utilization review: The assessment of a claimant's mental health care for assurance that it is necessary and of good quality. Assessments typically consider the appropriateness of the place of care, level of care, and the duration, frequency or quantity of services provided in relation to the accepted condition being treated.

Victim: A person who suffers bodily injury or death as the proximate result of a criminal act of another person, the claimant's own good faith and reasonable effort to prevent a criminal act, or his or her good faith effort to apprehend a person reasonably suspected of engaging in a criminal act. For the purposes of receiving benefits, "victim" is interchangeable with "employee" or "worker" as defined in the Industrial Insurance Act. For the purpose of these rules "bodily injury" means any harmful or offensive touching, and includes severe emotional distress where no touching takes place as defined and under the conditions outlined in WAC 296-30-010(2).

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-020, filed 7/5/95, effective 8/5/95. Statutory Authority: Chapter 7.68 RCW. 94-02-015, § 296-31-020, filed 12/23/93, effective 1/24/94. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-020, filed 11/13/92, effective 12/14/92.]

WAC 296-31-030 General provider requirements—

Who may treat. (1) Mental health providers who may treat claimants under the Crime Victims Act must register with the crime victims compensation program and qualify as an approved provider under these rules. The department must register the mental health provider before the mental health provider is eligible for payment for services.

(2) Washington permanently licensed psychiatrists, psychologists and advanced registered nurse practitioners with a specialty in psychiatric and mental health nursing, and registered and/or certified master level counselors whose master's degree is in a field of study related to mental health services including but not limited to, social work, marriage and family therapy or mental health counseling, who are registered with the crime victims program are authorized to provide treatment in accordance with these rules to claimants.

Out-of-state providers must be licensed, registered and/or certified in accordance to the licensing requirements within the state in which they practice. Copies of license, registration and/or certification must be provided when applying for approval to treat Washington state crime victims.

In areas where the department has determined licensed, registered and/or certified providers are not available, the department may consider registration exceptions on an individual case basis.

(3) The department has a duty to supervise provision of proper and necessary mental health care that is delivered promptly, efficiently, and economically. The department may deny, revoke, suspend, limit, or impose conditions on a mental health care provider's authorization to treat victims under the Crime Victims Act. Reasons for imposing any of the above restrictions include, but are not limited to the following:

(a) Negligence or incompetence which results in injury to a claimant or which creates an unreasonable risk that a claimant may be harmed.

(b) The illegal possession, use, prescription for use, or distribution of controlled substances, legend drugs, or addictive, habituating, or dependency-inducing substances in any way other than for therapeutic purposes.

(c) Any temporary or permanent probation, suspension, revocation, or other relevant type of limitation of a provider's license, certification or registration to practice by any court, board, or administrative agency.

(d) The commission of any act involving moral turpitude, dishonesty, or corruption relating to the practice of the provider's profession. The act need not constitute a crime. If a conviction or finding of such an act is reached by a court or other tribunal pursuant to plea, hearing, or trial, a certified copy of the conviction or finding is conclusive evidence of the violation.

(e) Failure to comply with the department's orders, rules, or policies.

(f) Failure, neglect, or refusal to:

(i) Submit copies of license, certification and/or registration and degree to the department.

(ii) Maintain and provide records requested by the department pursuant to a health care services review or an audit.

(iii) Submit complete, adequate, and detailed reports or additional reports requested or required by the department regarding the treatment and condition of a claimant.

(g) The submission of, or collusion in the submission of, false or misleading reports or bills to any government agency.

(h) Billing a claimant for:

(i) Treatment of a condition for which the department has accepted responsibility; or

(ii) Any amount more than the amount paid by the department under the maximum allowable fee set forth in these rules and any other charge with the exception of "no show" appointment charges. The department has no provision to pay charges for missed appointments, except for independent assessments arranged by the department. Claimants may be billed directly for missed or "no show" appointments.

(i) Repeated failure to recognize emotional and social factors impeding recovery of a claimant who is being treated under the Crime Victims Act.

(j) Repeated unreasonable refusal to comply with the recommendations of board certified or qualified consultants who have examined or reviewed a claim for the department.

(k) Repeated use of:

(i) Treatment of controversial or experimental nature;

(ii) Contraindicated or hazardous treatment; or

(iii) Treatment past stabilization of the condition or after maximum mental health improvement has been obtained.

(l) Declaration of mental incompetency by a court or other tribunal.

(m) Failure to comply with the applicable code of professional conduct or ethics.

(n) Failure to inform the department of any disciplinary action issued by order or formal letter taken against the provider's license, certification or registration to practice.

(o) The finding of any peer group review body of reason to take action against the provider's practice privileges.

(p) Misrepresentation or omission of any material information in the application for authorization to treat claimants.

(q) Repeated billing of the department for services that are available to claimants from public or private insurance sources. The crime victims compensation program is a secondary insurer. Providers should bill the department only after all benefits available to the claimant from public or private insurance are exhausted.

(4) If the department finds reason to take corrective action, the department may also order one or more of the following:

(a) Recoupment of payments made to the provider, including interest; at the rate of one percent per month or portion of a month beginning on the thirty-first day after payment was made.

(b) Denial or reduction of payment;

(c) Placement of the provider on a prepayment review status requiring the submission of supporting documents prior to payment;

(d) Requirement to satisfactorily complete education courses and/or programs; and

(e) Imposition of other appropriate restrictions or conditions on the provider to include revocation of the privilege to be reimbursed for treating victims under the Crime Victims Act.

(5) The department shall forward a copy of any corrective action taken against a provider to the applicable disciplinary authority.

(6) Appeal and protest rights: A provider may file a written protest to any department order, decision, or award. An appeal or protest to an order or decision demanding repayment of sums must be submitted to the department or the board of industrial insurance appeals within twenty days from receipt of the order or decision. An appeal or protest to an order or decision regarding other issues, e.g., ongoing treatment or provider eligibility, must be filed within sixty days from receipt of the order or decision. Appeal and protest rights are governed under chapter 51.52 RCW and RCW 7.68.110.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-030, filed 7/5/95, effective 8/5/95. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-030, filed 11/13/92, effective 12/14/92.]

WAC 296-31-050 Initial treatment and application for benefits. (1) It is the responsibility of the crime victim to notify the provider if the claimant has reason to believe his or her condition is related to a criminal assault. If the attending provider discovers a condition which he or she believes to be crime related or has reason to believe a condition is crime related, he or she must so notify the claimant. It is the provider's responsibility to ascertain whether he or she is the first attending provider. If so, the following action shall be taken by the attending provider:

(a) Provide crisis intervention if necessary.

(b) Immediately complete the provider portion of the application for benefits.

(c) Instruct and give assistance to the crime victim in completing his or her portion of the application for benefits.

In completing a claim or application, the following information is necessary so there is no delay in adjudication of the claim or payment of compensation:

(i) Complete history of the condition, physical findings if appropriate, and symptomatology resulting from the crime.

(ii) Specific diagnosis with ICD-9-CM or DSM III-R or DSM IV code(s), including axes 1 through 5, or a description of symptoms, consistent with and connected to the diagnostic criteria contained within DSM III-R, or DSM IV, relating to the injury.

(iii) Type of treatment rendered.

(iv) Known emotional, or social conditions which may influence recovery or cause complications.

(v) Estimate of time loss (if any) due to the injury.

(2) If the claimant remains under the provider's care, continue with necessary treatment in accordance with mental health rules.

If the provider is not the original attending provider, he or she should question the claimant to determine whether an application for benefits has been filed for the condition. If no application has been previously filed, it should be completed immediately and forwarded to the department with information as to the name and address of the original provider if known, so that he/she may be contacted for

necessary information. If an application has been filed, it is necessary to have the claimant submit in writing a request for transfer as outlined in WAC 296-31-065, if the claimant and provider agree that a change of provider is desirable.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-050, filed 7/5/95, effective 8/5/95. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-050, filed 11/13/92, effective 12/14/92.]

WAC 296-31-060 Reporting requirements. The department may require reports at any time as is necessary in order to determine initial or continued authorization of benefits or services. However, the department requires the following reports at various stages of a claim in order to authorize mental health treatment or services, time loss compensation, and bill payments for innocent victims of crime:

(1) **Initial report of injury:** To establish a claim, an application for benefits must be completed and submitted to the department. The provider may bill under code 1040M for the filing of the application. In addition, the examination or assessment charge may be billed. Reimbursement of these services will be paid if the claim is allowed by the department. Billing for an extended or comprehensive visit of more than one hour may require submission of additional reports.

(2) **Initial evaluation report:** This report must be submitted by the provider no later than thirty days from the date of first treatment or the date the claim is allowed, whichever is later. The report must include the preliminary diagnosis and symptoms, proposed treatment plan and treatment goals, including the treatment modality or modalities to be employed, and expected length of treatment. It must also include a diagnosis of any preexisting conditions and their potential effect on the condition resulting from the assault. Any change in the treatment plan must be addressed either in a modified treatment plan submitted to the department or in a ninety-day narrative report. Absence of a response from the department to the proposed treatment plan or modification within fourteen days shall constitute authorization to proceed with the plan as long as the treatment plan does not contain measures requiring preauthorization per WAC 296-31-010(5).

(3) **Office notes and follow-up visits:** Legible copies of office or progress notes or other work products may be, as determined by the department, required documentation to substantiate all follow-up visits or treatment following the initial evaluation. Office notes are not acceptable in lieu of requested narrative reports.

(4) **Ninety-day narrative reports:** When treatment is to continue beyond ninety days from the first date of treatment, submission of a narrative report is required every ninety days to substantiate the need for continued care. A narrative report must contain the basic information outlined in these rules. A narrative report should be billed under code 0100C and described as a ninety-day report. Treatment in excess of ninety days may be authorized by the department only after receipt and review of the ninety-day narrative report. Absence of a response from the department to a report shall constitute authorization for continued treatment. When treatment beyond ninety days will not be authorized or is authorized with limits on frequency or

provider type, notification will be sent by the department giving a thirty-day transition period. In the case of a contested decision, a claimant or a provider may file a written protest to the department or appeal to the board of industrial insurance appeals. Ninety-day progress reports must include current DSM III, DSM IV, and/or ICD-9-CM diagnosis(es), their relationship (if any) to the conditions sustained as the result of the criminal act, a summary of the progress made toward therapy goals or issue resolutions established in the initial evaluation, an estimate of the duration and frequency of further sessions and an updated prognosis for recovery.

(5) **Hospital reports:** When the claimant is hospitalized, it is the responsibility of the attending mental health provider to submit his or her reports to the hospital for submission with the hospital billing. The attending mental health provider may bill for hospital visits without attaching copies of the reports.

(6) **Consultation reports:** To substantiate treatment of more than one hundred eighty days, a consultation with a consultant chosen by the attending mental health provider is required. The department may require the claimant to be examined by the consultant as part of the consultation process with supervisory approval. Although no prior authorization is required for such consultations, the consultant must meet crime victims compensation program's provider registration requirements and the department must be notified when such consultation is arranged. The consultant is responsible for submitting a copy of the report, following guidelines developed by the department, within fifteen days from the date of the consultation. Treatment may only be authorized to extend beyond one hundred eighty days in mental health cases after the department has received this report. Absence of response, by the department upon receipt of the report shall constitute authorization for additional treatment. When extended treatment will not be authorized or will be terminated, notification will be sent by the department giving a thirty-day transition period. The department may request additional consultations and/or independent assessments as warranted by the individual case.

(7) **Termination reports:** When a mental health practitioner discontinues treatment of a claimant because the condition for which treatment was provided is fixed and stable or for any other reason, a termination report shall be completed and provided to the program within sixty days of the last visit.

(8) **Reopening application:** On claims closed over sixty days, the department will pay for completion of a reopening application (Code 1041M), an office visit and diagnostic studies necessary to complete the application. No other benefits will be paid until the adjudication decision is rendered. When reopening is granted, the department can pay benefits for a period not to exceed sixty days prior to the date the reopening application is received by the department.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030, 95-15-004, § 296-31-060, filed 7/5/95, effective 8/5/95. Statutory Authority: Chapter 7.68 RCW, 94-02-015, § 296-31-060, filed 12/23/93, effective 1/24/94. Statutory Authority: RCW 43.22.050, 92-23-033, § 296-31-060, filed 11/13/92, effective 12/14/92.]

WAC 296-31-065 Ongoing treatment. (1) Cases that remain open more than one hundred eighty days: When the claimant requires treatment beyond one hundred eighty days, a consultation with another mental health provider who meets the department's provider registration requirements, is necessary to determine and/or establish the need for continued treatment and/or payment of time-loss compensation. A detailed consultation report must be provided to the department.

Three levels of consultation are recognized: Limited, extensive and complex. Detailed descriptions of each type of consultation are included under procedure codes 0108C, 0109C and 0110C in the publication entitled *Crime Victims Compensation Mental Health Treatment Rules and Fees*.

(2) Procedures and/or continued treatment requiring consultation: In the event of complication, controversy, or dispute over the treatment aspects of any claim, the department will not authorize continued treatment until the complication, controversy, or dispute has been resolved and the department has received notification of any findings and reviewed any recommendations.

(a) The department may consider claims as complicated, controversial or disputed when involving treatment or conditions as follows:

(i) All counseling or psychotherapy, pertaining to immediate family members, requiring treatment sessions of more than twelve visits.

(ii) All family therapy visits, not including the claimant, requiring more than twelve visits.

(iii) All conditions not related to the accepted condition involving emotional, psychiatric, or social problems which are likely to complicate recovery.

(iv) All therapeutic procedures of a controversial nature or type not in common use for the specific condition.

(v) Cases where there are complications or unfavorable circumstances such as age, preexisting conditions, or, because of occupational requirements, etc.

(vi) Elective nonemergent hospital admission.

(vii) Any other circumstance that the department may define.

(b) The department may resolve issues of claim complication, controversy, or dispute using consultants, independent assessments and/or requesting a review of policies or procedures by the department's mental health advisory committee. The committee may recommend courses of action to resolve these issues to including, but not limited to, recommendation of an independent assessment.

(c) In cases presenting diagnostic or therapeutic problems difficult to resolve to the attending mental health provider (psychiatrist, psychologist and/or counselor), consultation with a specialist will be allowed without prior authorization. The consultant must submit his or her findings and recommendations immediately to the attending provider and the department.

(i) Whenever possible, the referring mental health provider should make his or her records available to the consultant to avoid unnecessary duplication. Consultants may proceed with indicated and reasonable diagnostic studies as permitted within their scope of practice.

(ii) Consultations must be held within the local geographic area of the claimant's residence, if possible, and with

a consultant not having a mutual proprietary or business interest with the attending mental health provider. Exceptions to this requirement may be made only with department preauthorization. The department does not prohibit the use of members of the same professional or social associations.

(iii) The mental health provider will not arrange a consultation if notification has been received that an independent assessment is being arranged by the department. If a recent consultation has been completed and the attending mental health provider is notified that the department is arranging an assessment, the department must be advised immediately of the consultation.

(iv) The consultation fee will be paid only if a consultation report is complete and contains all psychological findings as well as all pertinent negative or normal findings. The report must be received in the department within fifteen days from the date of the consultation. No fee may be paid to the consultant, by the department, if the claimant misses/fails to attend the appointment. However, the claimant may be billed directly.

(v) The consultant may not order, prescribe, or provide treatment without the consent of the claimant. No transfer will be made to the consultant without the written request of the claimant.

(3) Concurrent treatment: In some cases, treatment by more than one provider may be allowed. The department will consider authorization of concurrent treatment when the accepted condition requires specialty or multidisciplinary care. (Individual and group counseling sessions provided by more than one provider is not concurrent treatment.) When requesting consideration of concurrent treatment, the attending mental health provider must provide the department with the following: The name, address, discipline, and specialty of all other providers requested to assist in the treatment of the claimant and an outline of their responsibility in the case and an estimate of the length of the period of concurrent care. When concurrent care is allowed, the department will recognize one primary attending mental health provider, who will be responsible for directing the over-all treatment program; providing copies of all reports and other data received from the involved providers and, in time loss cases, providing the adequate certification evidence of the claimant's inability to work. The department will approve concurrent care on an individual case basis.

(4) Transfer of attending provider: All transfers from one provider to another must be approved by the department. Normally transfers will be allowed only after the claimant has been under the care of the attending mental health provider for sufficient time for the provider to: Complete the necessary diagnostic studies, establish an appropriate treatment regimen, and evaluate the efficacy of the therapeutic program. Under RCW 51.36.010 claimants are entitled to free choice of attending provider subject to the limitations of RCW 7.68.130. Except as provided under (a) through (g) of this subsection, no reasonable request for transfer will be denied. The claimant must be advised when and why a transfer is denied. The department reserves the right to require a claimant to select another provider for treatment, under the following conditions:

(a) When more conveniently located providers, qualified to provide the necessary treatment, are available.

(b) When the attending provider fails to cooperate in observance and compliance with the department rules.

(c) In time loss cases where reasonable progress towards return to work is not shown.

(d) Cases requiring specialized treatment, which the attending provider's authority is not qualified to render, or is outside the scope of the attending provider's authority to practice.

(e) Where the department finds a transfer of provider to be appropriate and has requested the claimant to transfer in accordance with this rule, the department may select a new attending provider if the claimant unreasonably refuses or delays in selecting another attending provider.

(f) In cases where the attending provider is not qualified to treat each of several accepted conditions. This does not preclude concurrent care where indicated.

(g) No transfer will be approved to a consultant without the written request of the claimant. Transfers will be authorized for the foregoing reasons or where the department in its discretion finds that a transfer is in the best interest of returning the claimant to a productive role in society.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-065, filed 7/5/95, effective 8/5/95. Statutory Authority: Chapter 7.68 RCW. 94-02-015, § 296-31-065, filed 12/23/93, effective 1/24/94. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-065, filed 11/13/92, effective 12/14/92.]

WAC 296-31-069 Independent assessments. (1)

Independent assessments may be ordered by the department or requested of the department by the attending provider. Such assessments are usually ordered or requested after consultations for one of the following purposes:

(a) To establish a diagnosis. Prior diagnoses may be controversial or ill-defined.

(b) To outline the treatment rationale, where treatment or progress is vague or controversial.

(c) To establish therapeutic data to determine if the condition requiring treatment is related to conditions sustained and allowed by the department as a result of a specific criminal act.

(d) To determine the extent and duration of aggravation of any preexisting mental health condition.

(e) To establish when the claimant has reached maximum benefit from treatment.

(f) To establish a percentage rating of any permanent impairment, for mental health conditions when maximum recovery is reached.

(g) To determine indications for reopening of a claim for further treatment on basis of the aggravation of the accepted condition.

(h) To determine eligibility qualifications of claimants applying under RCW 7.68.060(3), the repressed memory provision of the Crime Victims Act.

(2) Independent assessments for mental health conditions may be ordered by claims adjudicators without supervisory approval to rate permanent impairment when treatment has been completed, to determine the department's responsibility for treatment that has been rendered retroactively where significant causal relationship questions exist and to determine eligibility qualifications of claimants applying under RCW 7.68.060(3), the repressed memory provision of the Crime Victims Act. All other reasons for ordering

independent assessments for mental health conditions require supervisory approval.

(3) The following shall be reported by the assessing practitioner:

(a) Independent assessments must be specific and factual.

(b) The claimant's medical and mental health history must be checked for accuracy, variation or exaggeration compared to documented history provided to the examiner for this assessment.

(c) Diagnosis: Must be specific and describe the mental health condition and symptomatology found using DSM III-R, or DSM IV, and be substantiated by history.

(d) Conclusions: Must be specific and must definitely express an opinion concerning the purpose for which the assessment was requested, and should be consistent with the history and diagnosis reported.

(e) Permanent disability: Ratings must be supported by sufficient data to establish the category disability rating; also the report must demonstrate and articulate a definite causal relationship to the accepted condition(s) on a more probable than not basis.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-069, filed 7/5/95, effective 8/5/95. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-069, filed 11/13/92, effective 12/14/92.]

WAC 296-31-070 Provider obligations—Acceptance of rules and fees. (1) The filing of a crime victims compensation claim, or the rendering of treatment to a victim who comes under the department's jurisdiction constitutes acceptance of the department's crime victims compensation mental health rules and mental health fees and compliance with its rules and fees. In accordance with RCW 7.68.060(1) of the Crime Victims Act, when a mental health provider renders treatment to a victim entitled to benefits under the law, it shall be the duty of the mental health provider to inform the victim of his or her rights under this title and to lend all necessary assistance in making the application for compensation and such proof of other matters as required by the rules of the department without charge to the victim; a victim shall not be billed for treatment rendered for his or her accepted condition. The department may be contacted to obtain brochures and copies of the act.

When there is questionable eligibility, (e.g., service is not usually allowed for crime victims when a investigation or claim determination is pending), the provider may require the claimant to pay for the treatment rendered. In cases of questionable eligibility where the provider has billed the claimant or other insurance, and the claim is subsequently allowed, the provider shall refund the claimant in full within thirty days of notification of allowance of claim and bill the department for services rendered at usual and customary charges. Cases in which there is a question of ethics or quality of care will be referred to the department of health.

(2) The department must be notified immediately when an unrelated condition is being treated concurrently with an accepted condition.

(3) Penalties. The reporting requirements and penalty provision for physicians contained in RCW 51.36.060 and

51.48.060 shall be the same for physicians under these rules pursuant to RCW 7.68.100.

(4) Conditions preexisting the accepted condition are not the responsibility of the department. When an unrelated condition is being treated concurrently with the accepted condition, the attending practitioner must notify the department immediately and submit the following:

(a) Diagnosis and/or nature of unrelated condition.

(b) Treatment being rendered.

(c) The effect, if any, on accepted condition.

Temporary treatment of an unrelated condition may be allowed, upon prior approval by the department, provided these conditions directly retard recovery of the accepted condition. The department will not approve or pay for treatment for a known preexisting unrelated condition for which the claimant was receiving treatment prior to his or her crime victims claim, which is not retarding recovery from his or her accepted condition.

A thorough explanation of how the unrelated condition is affecting the accepted condition must be included with the request for authorization.

The department will not pay for treatment of an unrelated condition when it no longer exerts any influence upon the accepted condition. When treatment of an unrelated condition is being rendered, reports must be submitted monthly outlining the effect of treatment on both the unrelated and the accepted conditions.

The department will not pay for treatment of unrelated conditions unless specifically authorized, including purchases of drugs or medicines.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-070, filed 7/5/95, effective 8/5/95. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-070, filed 11/13/92, effective 12/14/92.]

WAC 296-31-075 Excess recoveries. In cases where a recovery has been made resulting in an excess recovery subject to offset from the future benefits or compensation due, the department is not liable for payment for services rendered by providers. The claimant is responsible for payment at department fee schedule rates. The claimant should be treated and the department billed in accordance with these mental health treatment rules and instructions. When bills are processed against the amount of the excess recovery, the department will notify the provider. The department will resume financial responsibility to or on behalf of the claimant when the amount of such excess has been reduced to zero. Charges for reports, consultations and other actions required of providers by the department solely for the purpose of the department's management of claims will be paid by the department during the period within which the excess recovery is being reduced.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-075, filed 7/5/95, effective 8/5/95. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-075, filed 11/13/92, effective 12/14/92.]

WAC 296-31-080 Billing procedures. (1) All services rendered must be in accordance with these mental health treatment rules. The department may reject bills for services rendered in violation of these rules. The claimant may not be billed for services rendered in violation of these

rules. However, claimants may be billed if they fail to keep or miss a properly scheduled appointment.

Providers shall bill their usual and customary fee for services. If a usual and customary fee for any particular service is lower to the general public than listed in the fee schedules, the practitioner shall bill the department at the lower rate.

(a) Bills must be itemized on department forms or other forms which have been approved by the department. Physicians, advanced registered nurse practitioners, psychologists, and masters level mental health counselors may use the National Standard HCFA 1500 Health Insurance Claim Form or the department's statement for crime victim services. When billing for treatment of a family member other than the claimant, you must identify the family member by name and relationship to the claimant. Hospitals use the UB-92 billing form for institution services and the National Standard HCFA 1500 Health Insurance Claim Form for professional services.

(b) Bills must specify the date and type of service, the appropriate procedure code, the condition treated, and the charges for each service.

(c) Every bill submitted to the department must be completed to include the following:

- (i) Claimant's name and address;
- (ii) Claimant's claim number;
- (iii) Date of injury;
- (iv) Referring provider's name;
- (v) Dates of service;
- (vi) Place of service;
- (vii) Type of service;
- (A) Psychiatrists and psychologists use type of service

3.

(B) Master level counselors use type of service M.

(C) Advanced registered nurse practitioners (ARNP) use type of service N.

(viii) Appropriate procedure code or hospital revenue code,

(ix) Description of service; if mental health patient is not the claimant, give name and relationship to the claimant;

- (x) Charge;
- (xi) Units of service;
- (xii) Total bill charge;
- (xiii) Provider of service;
- (xiv) Group, clinic, center, or facility name;
- (xv) Billing address;
- (xvi) Federal tax information;
- (A) Federal tax identification number; or
- (B) Social Security number.

(xvii) Date of billing;

(xviii) Submission of supporting documentation required under (f) of this subsection;

(xix) Private or public insurance eligibility and amounts paid.

(d) Responsibility for the completeness and accuracy of the description of services and charges billed rests with the provider rendering the service, regardless of who actually completes the bill form.

(e) Providers are urged to bill on a monthly basis. Bills must be submitted within ninety days from the date of service to be considered for payment. If insurance or public agency collateral resources exist bills must be received

within ninety days following payment or rejection by the resource. A copy of the payment or rejection must accompany the bill.

(f) The following supporting documentation must be maintained and submitted when billing for services, as may be appropriate:

- (i) Intake evaluation;
- (ii) Progress reports;
- (iii) Consultation reports;
- (iv) Special or diagnostic study reports;
- (v) Independent assessment or closing exam reports;
- (vi) For BR procedures - see WAC 296-31-090 for requirements;
- (vii) Claimant public or private insurance information.

(g) The claim number must be placed in the upper right hand corner on each bill and on each page of reports and other correspondence.

(h) Rebills. If a provider does not receive payment or notification from the department within ninety days, services may be rebilled. Rebills must be submitted for services denied if a claim is closed or rejected and subsequently reopened or allowed. Rebills should be identical to the original bill: Same charges, codes, and billing date. The statement "rebill" must appear on the bill.

(i) Any inquiries regarding adjustment of charges must be submitted within ninety days from the date of payment to be considered.

(j) Any denied charge may be protested in writing to the department or appealed to the board of industrial insurance appeals.

(2) Allowance and payment for medication. The department will pay for medications or supplies dispensed for the treatment of conditions resulting from a crime victim injury and/or conditions which are retarding the recovery from the claimant's condition, for which the department has accepted temporary responsibility. Specific information governing allowance and payment for medication is contained in WAC 296-20-17001.

(3) Payment of out-of-state providers.

(a) Providers of mental health services in the bordering states of Oregon and Idaho shall bill and be paid according to Washington state rules.

(b) Providers of health services in other states and other countries shall be paid at rates which take into account:

- (i) Payment levels allowed under the state of Washington crime victims compensation program rules;
- (ii) Payment levels allowed under crime victims compensation or workers compensation programs in the state of the provider's place of business; and

(iii) The usual, customary, and reasonable charges in the state and city of the provider's place of business.

(c) In all cases these payment levels are the maximum allowed to providers of services to claimants. Should a provider's charge exceed the payment amount allowed under the state of Washington crime victim compensation program rules, the provider is prohibited from charging the claimant for the difference between the provider's charge and the allowable rate. Providers violating this provision are ineligible to treat claimants as provided by these mental health rules and are subject to other applicable penalties.

(d) Only those diagnostic and treatment services authorized under the state of Washington mental health rules may

be allowed by the department. As determined by the department, the scope of practice of providers in bordering states may be recognized for payment purposes, except that in all cases WAC 296-20-03002 (treatment not authorized) shall apply. Specifically, services permitted under crime victims compensation programs in the provider's place of business, but which are not allowed chapters 296-20, 296-30, and 296-31 WAC of the state of Washington, may not be reimbursed. When in doubt, the provider should verify coverage of a service with the department.

(e) Out-of-state hospitals will be paid according to WAC 296-30-081.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-080, filed 7/5/95, effective 8/5/95. Statutory Authority: Chapter 7.68 RCW. 94-02-015, § 296-31-080, filed 12/23/93, effective 1/24/94. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-080, filed 11/13/92, effective 12/14/92.]

WAC 296-31-090 Mental health fees. (1) Rules and billing procedures are presented in detail in the previous sections, some commonalities are repeated here for the convenience of mental health providers referring to the mental health fee section. Definitions and items unique to billing procedures and fees are also included.

Psychiatric care may be billed without time dimensions according to the procedure or service as are medical or surgical procedures. In billing psychotherapy procedures, time is only one aspect and may be expressed as is customary in the local area. For example, the usual appointment length of an individual psychotherapy procedure may be signified by the procedure code alone. The modifier '-52' may be used to signify a service that is reduced or less extensive than the usual procedure. The modifier '-22' may be used to indicate a more extensive service. Thus, psychotherapy procedures may be reported by the procedure code alone or by the procedure code with a modifier.

Facility charges are not payable when a provider elects to use hospital facilities or other outpatient facilities in lieu of maintaining a private practice office.

(2) Definitions.

By report - BR (by report) in the value column indicates that the value of this service is too unusual, variable or new to be assigned a unit value. The report shall provide an adequate definition or description of the services or procedures that explain why the services or procedures are too unusual, variable, or complex to be assigned a relative value unit, using any of the following as indicated:

(a) Diagnosis - ICD9 - DSM III or DSM IV.

(b) Whenever possible, list the nearest similar procedure by number according to this schedule.

The department may adjust BR procedures when such action is indicated.

Maximum fees - The maximum allowable fee for a procedure is the fee contained in the publication entitled *Crime Victims Compensation Program Mental Health Treatment Rules and Fees*. Prior to the establishment or amendment of the fee schedules, the department will give at least thirty calendar days notice by mail to interested persons who have made timely request for advance notice of the establishment or amendment of the fee schedules. To request advance notice of the establishment or amendment of

the fee schedules, interested persons must contact the department at the following address:

Department of Labor and Industries
Crime Victims Compensation Section
P.O. Box 44520
Olympia, WA 98504-4520

No fee is payable by the department for missed appointments unless the appointment is for an examination arranged by the department. Claimants may be billed directly for missed or "no show" appointments.

Mental health modifiers - Listed values for most procedures may be modified under certain circumstances. When applicable, the modifying circumstance should be identified by the addition of the appropriate "modifier code number" after the usual procedure number. The value should be listed as a single modified total for the procedure.

Report required - The values for procedures for which a report is required include the report fee. **Do not bill separately for these reports.**

Unusual or unlisted procedure - Value of unlisted services or procedures should be substantiated "by report" (BR). Refer to the definition of **By report** for reporting requirements.

(3) Advanced registered nurse practitioners are reimbursed at ninety percent of values listed for psychologists or psychiatrists.

(4) Mental health services. The following graduated listing of services is an attempt to reflect the relative values of the time and skills required at the various service levels. The listed values apply only when performed by mental health providers registered with and authorized by the department to provide services to claimants through this program.

Modifier	Unit Value
-22 UNUSUAL SERVICES: When the services provided are greater than those usually required for the listed procedure, identify by adding this modifier to the usual procedure number. Requires written justification	BR
-52 REDUCED VALUES: Under certain circumstances, the listed value for a procedure is reduced or eliminated because of ground rules, common practice, or at the mental health provider's election. Under these or similar circumstances, the services provided can be identified by their usual procedure numbers and the use of a reduced value indicated by adding this modifier to the procedure number. (Use of this modifier provides a means of reporting services at a reduced charge without disturbing usual relative values.)	BR
-8N CONCURRENT CARE, SERVICES RENDERED BY MORE THAN ONE PROVIDER: When the claimant's condition requires the additional services of more than one provider, each provider may identify his or her services by adding this modifier to the service procedure code	BR

-96 SPECIAL AGREEMENT WITH CRIME VICTIMS COMPENSATION PROGRAM: This modifier is to be used by providers who have a special agreement with the crime victims compensation program for certain designated procedures. Any request for special agreement should be directed to:

Crime Victims Compensation Program
Special Claim Unit
PO Box 44523
Olympia WA 98504-4523

THE VALUES FOR PROCEDURES FOR WHICH A REPORT IS REQUIRED INCLUDE THE REPORT FEE. DO NOT BILL SEPARATELY FOR THESE REPORTS.

[Statutory Authority: RCW 7.68.030, 51.04.020(1) and 51.04.030. 95-15-004, § 296-31-090, filed 7/5/95, effective 8/5/95. Statutory Authority: Chapter 7.68 RCW. 94-02-015, § 296-31-090, filed 12/23/93, effective 1/24/94. Statutory Authority: RCW 43.22.050. 92-23-033, § 296-31-090, filed 11/13/92, effective 12/14/92.]

Chapter 296-45 WAC

SAFETY STANDARDS—ELECTRICAL WORKERS

WAC

296-45-65047 Specification for lineworker's belts and similar equipment.

WAC 296-45-65047 Specification for lineworker's belts and similar equipment. (1) All hardware for lineworker's body belts, safety straps and lanyards shall be drop forged or pressed steel and have a corrosive resistive finish tested to the American Society for Testing and Materials B117 as published in 1964 (50 hour test). Surfaces shall be smooth and free from sharp edges.

(a) All buckles shall be those guaranteed by the manufacturer as having at least a 2,000-pound tensile strength with a maximum permanent deformation no greater than one sixty-fourth inch.

(b) All "D" rings shall be those guaranteed by the manufacturer as having at least a 5,000-pound tensile strength without cracking or breaking.

(c) All snap hooks shall be those guaranteed by the manufacturer as having at least a 5,000-pound tensile strength without distortion sufficient to release the keeper.

(d) All fabric used for safety straps shall be guaranteed by the manufacturer as being capable of withstanding either AC or DC dielectric test of not less than 25,000 volts per foot "dry" for 3 minutes without visible deterioration.

(e) All fabric and leather used shall be that which has been represented by the manufacturer as having been tested for leakage current of 1 milliampere with a potential 3,000 volts when applied to the electrodes positioned 12 inches apart.

(f) The cushion part of the body belt may be either leather or other material provided that it;

(i) Has no exposed rivets on the inside;

(ii) Is at least 3 inches in width;

(iii) Is at least five thirty-seconds inch thick, if made of leather; or have equivalent strength if made of other material.

(iv) Has pocket tabs that extend at least 1-1/2 inches down and three inches back of the inside of circle of each "D" ring for riveting on plier or tool pockets. On shifting "D" belts, this measurement for pocket tabs shall be taken when the "D" ring section is centered.

(v) A maximum of four tool loops shall be so situated on the body belt that four inches of the body belt in the center of the back, measuring from "D" ring to "D" ring, shall be free of tool loops and any other attachments.

(vi) All stitching shall be of minimum 42-pound weight nylon or equivalent thread and shall be lock stitched. Stitching parallel to an edge shall not be less than three-sixteenths inch from edge of narrowest member caught by the thread. The use of cross-stitching on leather is prohibited. Approved copper, steel or equivalent liners shall be used around the bar of "D" rings to reduce the wear.

(vii) The keeper of snap hooks shall have a spring tension that will not allow the keeper to begin to open with a weight of 2-1/2 pounds or less, but the keeper of snap hooks shall begin to open with a weight of four pounds, when the weight is supported on the keeper against the end of the nose.

(2) Testing lineworker's safety straps, body belts and lanyards shall be in accordance with the following procedure:

(a) Attach one end of the safety strap or lanyard to a rigid support, the other end shall be attached to a 250-pound canvas bag of sand;

(b) Allow the 250-pound canvas bag of sand to free fall 4 feet for (safety strap test) and 6 feet for (lanyard test), in each case stopping the fall of the 250-pound bag;

(c) Failure of the strap or lanyard shall be indicated by any breakage, or slippage sufficient to permit the bag to fall free of the strap or lanyard. The entire "body belt assembly" shall be tested using one "D" ring. A safety strap or lanyard shall be used that is capable of passing the "impact loading test" and attached as required in item (a) of this subdivision. The body belt shall be secured to the 250-pound bag of sand at a point to simulate the waist of a man and allowed to drop as stated in item (b) of this subdivision. Failure of the body belt shall be indicated by any breakage, or slippage sufficient to permit the bag to fall free of the body belt.

(d) Fall protection. Personal fall arrest equipment shall meet the requirements of Part C-1, chapter 296-155 WAC.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-45-65047, filed 4/25/95, effective 10/1/95; 94-20-057 (Order 94-16), § 296-45-65047, filed 9/30/94, effective 11/20/94; Order 76-38, § 296-45-65047, filed 12/30/76.]

Chapter 296-52 WAC

SAFETY STANDARDS FOR THE POSSESSION AND HANDLING OF EXPLOSIVES

WAC

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WAC 296-52-401 Scope and application. (1) This chapter is adopted pursuant to the State Explosives Act, RCW 70.74.020, in accordance with chapter 34.05 RCW, the Administrative Procedure Act, and chapter 49.17 RCW, the Washington Industrial Safety and Health Act.

(2) This chapter shall be identified as chapter 296-52 WAC, "safety standards for possession, handling and use of explosives" and hereafter be called the "explosive code."

(3) This chapter shall apply to:

(a) All aspects of manufacture, possession, storage, selling, purchase, transportation, and the use of explosives or blasting agents as defined in this chapter.

(b) Any person, partnership, company, corporation, or other entity, including governmental agencies, except:

(i) Storage, handling, and use of (noncommercial) military explosives while under the control of the United States Government and/or United States Military authorities.

(ii) Those instances and actions identified by RCW 70.74.191, "Exemptions."

(4) Fireworks regulations.

(a) "Common fireworks" classified as Class C explosives (International Designation 1.4) by the U.S. Department of Transportation shall be exempt from all requirements of this chapter. Common fireworks are subject to the requirements of chapter 70.77 RCW, State fireworks law, and chapter 212-17 WAC, fireworks regulations administered by the state department of community trade and economic development, fire protection services division.

(b) Fireworks classified as Class A or Class B explosives, (International Designation 1.1, 1.2 or 1.3) shall be subject to the storage (only) requirements of this chapter and shall be stored in magazines licensed by the department of labor and industries when unattended.

Notes: Fire protection services division administers requirements of the Uniform Fire Code and Uniform Building Code for Class C common fireworks storage.

(5) The manufacture of explosives or pyrotechnics, as defined in this chapter, shall comply with the requirements

of chapter 296-67 WAC, Safety standards for process safety management of highly hazardous chemicals.

(6) The enforcing authority of this chapter, the department of labor and industries, recognizes the obligation of other law enforcement agencies to enforce specific aspects or sections of chapter 70.74 RCW, the State Explosives Act, under local ordinance and with joint and shared authority as granted by RCW 70.74.201. The department of labor and industries shall cooperate with all other law enforcement agencies in carrying out the intent of the explosive code and the State Explosives Act.

(7) In all activities governed by the State Explosives Act, chapter 70.74 RCW, the director shall administer this chapter with the full resources of the department of labor and industries. Where materials classified by this chapter as explosives or blasting agents may be found or where the director has reasonable cause to expect they exist, administration of this chapter shall include the right of entry for inspection purposes into any location, facility, or equipment at any such times as the director or his designated representative deems appropriate and to issue penalty sanctions for all instances found not to be in compliance with the requirements of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-401, filed 3/6/95, effective 4/20/95; 92-17-022 (Order 92-06), § 296-52-401, filed 8/10/92, effective 9/10/92; 88-23-054 (Order 88-25), § 296-52-401, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-401, filed 5/6/86.]

WAC 296-52-409 Variance and procedure. Realizing that conditions may exist in operations under which certain state standards will not have practical application, the director of the department of labor and industries or his authorized representative may, pursuant to this section, RCW 49.17.080 and/or 49.17.090 and appropriate administrative rules of this state and the department of labor and industries and upon receipt of application and after adequate investigation by the department, permit a variation from these requirements when other means of providing an equivalent measure of protection are afforded. Such variation granted shall be limited to the particular case or cases covered in the application for variance and may be revoked for cause. The permit for variance shall be conspicuously posted on the premises and shall remain posted during the time it is in effect. All requests for variances from safety and health standards included in this or any other chapter of Title 296 WAC, shall be made in writing to the director of the department of labor and industries at Olympia, Washington, or his/her duly authorized representative, the assistant director, division of consultation and compliance, department of labor and industries, Olympia, Washington. Variance application forms may be obtained from the department upon request.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-409, filed 3/6/95, effective 4/20/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-409, filed 5/6/86.]

WAC 296-52-413 Equipment approval by nonstate agency or organization. Whenever a provision of this chapter states that only that equipment or those processes approved by an agency or organization other than the

department of labor and industries, such as the Underwriters Laboratories, Mine Safety and Health Administration or the National Institute for Occupational Safety and Health, shall be construed to mean that approval of such equipment or process by the designated agency or group shall be prima facie evidence of compliance with the provision of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-413, filed 3/6/95, effective 4/20/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-413, filed 5/6/86.]

WAC 296-52-417 Definitions. Definitions as used in this chapter, unless a different meaning is plainly required by the context:

"American Table of Distances" means American Table of Distances for Storage of Explosives as revised and approved by the Institute of the Makers of Explosives.

"Approved storage facility" means a facility for the storage of explosive materials conforming to the requirements of this part and covered by a license or permit issued under authority of the department of labor and industries. (See WAC 296-52-441.)

"Attend" means the physical presence of an authorized person within the field of vision of explosives. The said attendant shall be awake, alert and not engaged in activities which may divert attention so that in case of an emergency the attendant can get to the explosives quickly and without interference, except for brief periods of necessary absence, during which absence simple theft of explosives is not ordinarily possible.

"Authorized," "approved" or "approval" means authorized, approved, or approval by the department of labor and industries or other approving agency or individual as specified by the provisions of this chapter.

"Authorized person" means a person approved or assigned by the employer, owner, or licensee to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite.

"Barricaded" means the effective screening of a building containing explosives from a magazine or other building, railway, or highway by a natural or an artificial barrier. A straight line from the top of any sidewall of the building containing explosives to the eave line of any magazine or other building or to a point twelve feet above the center of a railway or highway shall pass through such barrier.

"Blast area" means the area of a blast within the influence of flying rock missiles, gases, and concussion.

"Blast pattern" means the plan of the drill holes laid out on a bench; an expression of the burden distance and the spacing distance and their relationship to each other.

"Blast site" means the area where explosive material is handled during loading, including the perimeter of blast holes and 50 feet in all directions from loaded holes or holes to be loaded. In underground mines 15 feet of solid rib or pillar can be substituted for the 50 foot distance.

"Blaster" means that qualified person in charge of and responsible for the loading and firing of a blast.

"Blaster in charge" shall mean a licensed blaster who is fully qualified in the blasting process to be used including all aspects of storage, handling and use as recommended by the

manufacturer and as required by this chapter. He/she shall be adequately trained and experienced as to be capable of recognizing hazardous conditions throughout the blast site and has the authority to take prompt corrective action.

"Blasting agent" means any material or mixture consisting of a fuel and oxidizer, intended for blasting, not otherwise classified as an explosive, and in which none of the ingredients are classified as an explosive, provided that the finished product, as mixed and packaged for use or shipment, cannot be detonated when unconfined by means of a No. 8 test blasting cap.

"Blockholing" means the breaking of boulders by firing a charge of explosives that has been loaded in a drill hole.

"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to personnel or property, and who has authorization to take prompt corrective action to eliminate them.

"Conveyance" means any unit for transporting explosives or blasting agents, including but not limited to trucks, trailers, rail cars, barges, and vessels.

"Day box" means a box which is not approved as a magazine for unattended storage of explosives. Such box may be used for storage of explosives during working hours on a job site, provided that it shall always be guarded against theft, particularly in inhabited areas, and shall be attended or locked and secured against outright lifting, as the risk demands. Caps shall be safely separated from other explosives. Such day boxes shall be marked with the word "explosives" and be constructed in accordance with WAC 296-52-453(7).

"Dealer" means any person who purchases explosives or blasting agents for the sole purpose of resale, and not for use or consumption.

"Department" means the department of labor and industries.

"Detonating cord" means a round, flexible cord containing a center core of high explosive and used to initiate other explosives.

"Detonator" means any device containing any initiating or primary explosive that is used for initiating detonation. The term includes, but is not limited to, electric blasting caps of instantaneous and delay types, blasting caps for use with safety fuses, detonating cord delay connectors, and nonelectric instantaneous and delay blasting caps which use detonating cord, shock tube, or any other replacement for electric leg wires.

"Director" means the director of the department of labor and industries, or the designated representative.

"Efficient artificial barricade" means an artificial mound or properly revetted wall of earth of a minimum thickness of not less than three feet or such other artificial barricade as approved by the department of labor and industries.

"Electric blasting cap" means a blasting detonator designed for and capable of detonation by means of an electric current.

"Electric blasting circuitry" means:

- Bus wire. An expendable wire, used in parallel or series, in parallel circuits, to which are connected the leg wires of electric blasting caps.

- Connecting wire. An insulated expendable wire used between electric blasting caps and the leading wires or between the bus wire and the leading wires.

- Leading wire. An insulated wire used between the electric power source and the electric blasting cap circuit.

- Permanent blasting wire. A permanently mounted insulated wire used between the electric power source and the electric blasting cap circuit.

"Electric delay blasting caps" means caps designed to detonate at a predetermined period of time after energy is applied to the ignition system.

"Emulsion" means an explosive material containing substantial amounts of oxidizer dissolved in water droplets, surrounded by an immiscible fuel, or droplets of an immiscible fuel surrounded by water containing substantial amounts of oxidizer.

"Explosive" or "explosives" whenever used in this chapter means any chemical compound or mechanical mixture that is commonly used or intended for the purpose of producing an explosion, that contains any oxidizing and combustible units, or other ingredients, in such proportions, quantities or packing, that an ignition by fire, by friction, by concussion, by percussion, or by detonation of any part of the compound or mixture may cause such a sudden generation of highly heated gases that the resultant gaseous pressures are capable of producing destructive effects on contiguous objects or of destroying life or limb. In addition, the term "explosives" shall include all material which is classified as Class A, Class B, and Class C explosives by the federal Department of Transportation. For the purposes of this chapter small arms ammunition, small arms ammunition primers, smokeless powder not exceeding fifty pounds, and black powder not exceeding five pounds shall not be defined as explosives unless possessed or used for a purpose inconsistent with small arms use or other lawful purpose.

Note 1: As excerpted from RCW 70.74.010(4), classification of explosives shall include but not be limited to the following:

- Class A explosives: (Possessing detonating hazard) dynamite, nitroglycerin, picric acid, lead azide, fulminate of mercury, black powder exceeding five pounds, blasting caps in quantities of 1001 or more, and detonating primers.
- Class B explosives: (Possessing flammable hazard) propellant explosives, including smokeless propellants exceeding fifty pounds.
- Class C explosives: (Including certain types of manufactured articles which contain Class A or Class B explosives, or both, as components but in restricted quantities) blasting caps in quantities of 1000 or less.

Note 2: Under the authority of RCW 70.74.020(3), the department of labor and industries will accept federal (U.S. Department of Transportation and/or Bureau of Alcohol, Tobacco and Firearms) international identification marking on explosives and/or explosives containers or packaging in lieu of Washington state designated marking as defined in RCW 70.74.010 (Class A, B or C) and required by RCW 70.74.300. See Appendix III, WAC 296-52-555.

"Explosive-actuated power devices" means any tool or special mechanized device which is actuated by explosives, but not to include propellant-actuated power devices.

"Explosives manufacturing building" means any building or other structure (excepting magazines) containing explosives, in which the manufacture of explosives, or any processing involving explosives, is carried on, and any

building where explosives are used as a component part or ingredient in the manufacture of any article or device.

"Explosives manufacturing plant" means all lands, with the buildings situated thereon, used in connection with the manufacturing or processing of explosives or in which any process involving explosives is carried on, or the storage of explosives thereat, as well as any premises where explosives are used as a component part or ingredient in the manufacture of any article or device.

"Factory building" means the same as "manufacturing building."

"Forbidden or not acceptable explosives" means explosives which are forbidden or not acceptable for transportation by common carriers by rail freight, rail express, highway, or water in accordance with the regulations of the federal Department of Transportation.

"Fuel" means a substance which may react with oxygen to produce combustion.

"Fuse (safety)" means a flexible cord containing an internal burning medium by which fire or flame is conveyed at a continuous and uniform rate from the point of ignition to the point of use, usually a fuse detonator.

"Fuse cap (fuse detonator)" means a detonator which is initiated by a safety fuse; also referred to as an ordinary blasting cap.

"Fuse lighters" means special devices for the purpose of igniting safety fuse.

"Handler" means any person/individual who handles explosives for purposes of transporting, moving, or assisting a licensed user (blaster) in loading, firing, blasting, or disposing of explosives and blasting agents. This does not include employees of a licensed manufacturer engaged in manufacturing process, drivers of common carriers or contract haulers.

"Handloader" means any person who engages in the noncommercial assembling of small arms ammunition for personal use, specifically the operation of installing new primers, powder, and projectiles into cartridge cases.

"Handloader components" means small arms ammunition, small arms ammunition primers, smokeless powder not exceeding fifty pounds, and black powder as used in muzzle loading firearms not exceeding five pounds.

"Highway" shall mean and include any public street, public alley, or public road.

"Improvised device" means a device which is fabricated with explosives or destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and which is designed to disfigure, destroy, distract, or harass.

"Inhabited building" means only a building regularly occupied in whole or in part as a habitation for human beings, or any church, schoolhouse, railroad station, store, or other building where people are accustomed to assemble, other than any building or structure occupied in connection with the manufacture, transportation, storage, or use of explosives.

"Low explosives" means explosives materials which can be caused to deflagrate when confined, (for example, black powder, safety fuses, igniters, igniter cords, fuse lighters, and "special fireworks" defined as Class B explosives by U.S. Department of Transportation regulations in 49 CFR Part 173, except for bulk salutes).

"Magazine" means any building, structure or container, other than an explosive manufacturing building, approved for the storage of explosive materials.

"Manufacturer" means any person engaged in the business of manufacturing explosive materials for purposes of sale, distribution, or use, provided that the term manufacturing shall not include inserting a detonator into a cast booster or a stick of high explosive product to make a primer for loading into a blasthole. The term manufacturer also shall not include nor be applicable to the act of on-blast site mixing, either by hand or by mechanical apparatus, binary components, ammonium nitrate and fuel oil and/or emulsion products to create explosives for immediate down-blasthole delivery. This defined exclusion is limited to materials and components which are not classified by U.S. DOT as explosives until after they are mixed.

"Misfire" means the complete or partial failure of an explosive charge to explode as planned.

"Motor vehicle" means any self-propelled automobile, truck, tractor, semitrailer or full trailer, or other conveyance used for the transportation of freight.

"Mudcap" means covering the required number of cartridges that have been laid on top of a boulder with a three or four inch layer of mud (free from rocks or other material which might constitute a missile hazard). Mudcapping is also commonly known as "bulldozing" and "dobyng."

"Natural barricade" means any natural hill, mound, wall, or barrier composed of earth or rock or other solid material of a minimum thickness of not less than three feet. With site specific department approval, an acceptable natural barricade may be a stand of mature timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare of leaves.

"Nonelectric delay blasting cap" means a blasting cap with an integral delay element in conjunction with and capable of being detonated by a detonation impulse or signal from miniaturized detonating cord or shock tube.

"Oxidizer" means a substance that yields oxygen readily to stimulate the combustion of organic matter or other fuel.

"Permanent magazines" means magazines that are permanently fastened to a foundation and that are left unattended. The capacity of said permanent magazines shall not exceed the limits stated in RCW 70.74.040. Permanent magazines shall be approved and licensed.

"Person" means any individual, firm, copartnership, corporation, company, association, joint stock association, and including any trustee, receiver, assignee, or personal representative thereof.

"Person responsible," for an explosives magazine, means the legal person who actually operates the magazine and who is responsible for the proper storage, protection and removal of the explosives. The responsible person may be the owner or the lessee or the authorized operator of the magazine.

"Portable magazines" also called "field" magazines means magazines that are designed to be unattended and that are not permanently fastened to a foundation. Said magazines shall be so constructed or secured that they can not be readily lifted and carried away by unauthorized persons.

The capacity of said portable magazines shall be limited to the amount of explosives required for efficient operation. Portable magazines shall be approved and licensed.

"Possess" means the physical possession of explosives in one's hand, vehicle, magazine or building.

"Primary blasting" means the blasting operation by which the original rock formation is dislodged from its natural location.

"Primer" means a unit, package, cartridge, or container of explosives into which a detonator or detonating cord is inserted or attached to initiate other explosives or blasting agents.

"Propellant-actuated power device" means any tool or special mechanized device or gas generator system which is actuated by a propellant or which releases and directs work through a propellant charge.

"Public conveyance" means any railroad car, streetcar, ferry, cab, bus, airplane, or other vehicle which is carrying passengers for hire.

"Public utility transmission system" means power transmission lines over 10 kV, telephone cables, or microwave transmission systems, or buried or exposed pipelines carrying water, natural gas, petroleum, or crude oil, or refined products and chemicals, whose services are regulated by the utilities and transportation commission, municipal, or other publicly owned systems.

"Purchaser" means any person who buys, accepts, or receives any explosives or blasting agents.

"Pyrotechnics" means any combustible or explosive compositions or manufactured articles designed and prepared for the purpose of producing audible or visible effects which are commonly referred to as fireworks.

"Qualified person" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

"Railroad" means any steam, electric, or other railroad which carries passengers for hire.

"Railroad freight car" means cars that are built for and loaded with explosives and operated in accordance with DOT rules.

"Safety fuse" means a flexible cord containing an internal burning medium by which fire is conveyed at a continuous and uniform rate for the purpose of firing blasting caps.

"Secondary blasting" means the reduction of oversize material by the use of explosives to the dimension required for handling, including mudcapping and blockholing.

"Semiconductive hose" means a hose with an electrical resistance high enough to limit flow of stray electric currents to safe levels, yet not so high as to prevent drainage of static electric charges to ground; hose of not more than 2 meg-ohms resistance over its entire length and of not less than 5,000 ohms per foot meets the requirement.

"Shall" means that the rule establishes a minimum standard which is mandatory.

"Shock tube" means a small diameter plastic tube for initiating detonators. It contains a limited amount of reactive material so that the energy that is transmitted through the

tube by means of a detonation wave is guided through and confined within the walls of the tube.

"Should" means recommended.

"Small arms ammunition" means any shotgun, rifle, pistol, or revolver cartridge, and cartridges for propellant-actuated power devices and industrial guns. Military-type ammunition containing explosive bursting charges, incendiary, tracer, spotting, or pyrotechnic projectiles is excluded from this definition.

"Small arms ammunition primers" means small percussion-sensitive explosive charges encased in a cap or capsule and used to ignite propellant powder and shall include percussion caps as used in muzzle loaders.

"Smokeless propellants" means solid chemicals or solid chemical mixtures in excess of fifty pounds which function by rapid combustion.

"Special industrial explosive devices" means explosive-actuated power devices and propellant-actuated power devices.

"Special industrial explosives materials" means shaped materials and sheet forms and various other extrusions, pellets, and packages of high explosives, which include dynamite, trinitrotoluene (TNT), pentaerythritol tetranitrate (PETN), hexahydro-1, 3, 5-trinitro-s-triazine (RDX), and other similar compounds used for high-energy-rate forming, expanding, and shaping in metal fabrication, and for dismemberment and quick reduction of scrap metal.

"Springing" means the creation of a pocket in the bottom of a drill hole by the use of a moderate quantity of explosives in order that larger quantities or explosives may be inserted therein.

"Sprung holes" means to spring or chamber the bottom of the drilled hole to allow room for additional explosives as a bottom load.

"Stemming" means a suitable inert incombustible material or device used to confine or separate explosives in a drill hole, or to cover explosives in mudcapping.

"Trailer" means semitrailers or full trailers as defined by DOT, that are built for and loaded with explosives and operated in accordance with DOT rules.

"User" means any natural person, manufacturer, or blaster who acquires, purchases, or uses explosives as an ultimate consumer or who supervises such use.

"Water gels or slurry explosives" comprise a wide variety of materials used for blasting. They all contain substantial proportions of water and high proportions of ammonium nitrate, some of which is in solution in the water. Two broad classes of water gels are:

- Those which are sensitized by a material classed as an explosive, such as TNT or smokeless powder,
- Those which contain no ingredient classified as an explosive; these are sensitized with metals such as aluminum or with other fuels. Water gels may be premixed at an explosives plant or mixed at the site immediately before delivery into the bore hole.

"DOT specification" are regulations of the Department of Transportation published in 49 CFR Chapter I.

[Statutory Authority: Chapter 49.17 RCW, 95-07-014, § 296-52-417, filed 3/6/95, effective 4/20/95; 91-03-044 (Order 90-18), § 296-52-417, filed 1/10/91, effective 2/12/91; 90-03-029 (Order 89-20), § 296-52-417, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-417, filed 5/6/86.]

WAC 296-52-419 Basic legal obligations. (1) It is unlawful for any person to manufacture, purchase, sell, offer for sale, use, possess, transport, or store any explosive improvised device, or components that are intended to be assembled into an explosive or improvised device without having a validly issued license from the department of labor and industries which license has not been revoked or suspended. Violation of this section is a Class C felony.

(2) Upon notice from the department of labor and industries or any law enforcement agency having jurisdiction, a person manufacturing, purchasing, selling, offering for sale, using, possessing, transporting, or storing any explosives, improvised device, or components of explosives or improvised devices without a license shall immediately surrender those explosives, improvised devices, or components to the department or to the respective law enforcement agency.

(3) At any time that the director of labor and industries requests the surrender of explosives, improvised devices, or components of explosives or improvised devices from any person pursuant to subsection (2) of this section, the director may in addition request the attorney general to make application to the superior court of the county in which the unlawful practice exists for a temporary restraining order or such other relief as appears to be appropriate under the circumstances.

(4) Miscellaneous provisions - general hazard. No person shall store, handle, or transport explosives or blasting agents when such storage, handling, and transportation of explosives or blasting agents constitutes an undue hazard to life.

(5) No person, except the director of labor and industries or the director's authorized agent, the owner, the owner's agent, or a person authorized to enter by the owner or owner's agent, or a law enforcement officer acting within his or her official capacity, may enter any explosives manufacturing building, magazine or car, vehicle or other common carrier containing explosives in this state. Violation of this section is a gross misdemeanor punishable under chapter 9A.20 RCW.

(6) Unless otherwise allowed to do so under this chapter, a person who exhibits a device designed, assembled, fabricated, or manufactured, to convey the appearance of an explosive or improvised device, and who intends to, and does, intimidate or harass a person, is guilty of a Class C felony.

(7) Discharge of firearms or igniting flame near explosives.

(a) No person shall discharge any firearms at or against any magazine or explosives manufacturing buildings or ignite any flame or flame-producing device nearer than fifty feet from said magazine or explosives manufacturing building.

(b) No person shall discharge a firearm at a magazine or at explosive material.

(8) Every person who maliciously places any explosive or improvised device in, upon, under, against, or near any building, car, vessel, railroad track, airplane, public utility transmission system, or structure, in such a manner or under such circumstances as to destroy or injure it if exploded, shall be punished as follows:

(a) If the circumstances or surroundings are such that the safety of any person might be endangered by the explosion, by imprisonment in a state correctional facility for not more than twenty years.

(b) In every other case by imprisonment in a state correctional facility for not more than five years.

(9) It shall be unlawful for any person to abandon explosives or improvised devices. Violation of this section is a gross misdemeanor punishable under chapter 9A.20 RCW.

(10) If any provision of this act or its application to any person or circumstance is held invalid, the remainder of the act or the application of the provisions to other persons or circumstances is not affected.

(11) This chapter shall not preclude local jurisdictions such as city or county government, or other government authorities such as the Washington utilities and transportation commission or Washington state patrol from adopting and administering local ordinances or Washington Administrative Code regulations relating to explosives. Said rules and regulations however shall not diminish or replace any regulation of this chapter which will be administered by the director of labor and industries in all applications where explosives are stored, kept or had, without regard for employer-employee relationship.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-419, filed 3/6/95, effective 4/20/95; 90-03-029 (Order 89-20), § 296-52-419, filed 1/11/90, effective 2/26/90; 88-23-054 (Order 88-25), § 296-52-419, filed 11/14/88.]

WAC 296-52-421 Licenses—Information verification. (1) Any information request by the department, in order to verify statements in an application or in order to facilitate a department inquiry, shall be supplied prior to the issuance or renewal of a license.

(2) The director of labor and industries shall require, as a condition precedent to the original issuance or renewal of any explosive license, fingerprinting and criminal history record information checks of every applicant.

(a) In the case of a corporation, fingerprinting and criminal history record information checks shall be required for the management officials directly responsible for the operations where the explosives are used if such persons have not previously had their fingerprints recorded with the department of labor and industries.

(b) In the case of a partnership, fingerprinting and criminal history record information checks shall be required of all general partners.

(c) Such fingerprints as are required by the department of labor and industries shall be submitted on forms provided by the department to the identification section of the Washington state patrol and to the identification division of the Federal Bureau of Investigation in order that these agencies may search their records for prior convictions of the individuals fingerprinted.

(d) The Washington state patrol shall provide to the director of labor and industries such criminal record information as the director may request.

(e) The applicant shall give full cooperation to the department of labor and industries and shall assist the department of labor and industries in all aspects of fingerprinting and criminal history record information check.

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(f) The applicant may be required to pay a fee not to exceed twenty dollars to the agency that performs the fingerprinting and criminal history process.

(3) The director of labor and industries shall not issue a license to manufacture, purchase, store, use, or deal with explosives to:

(a) Any persons under twenty-one years of age;

(b) Any person whose license is suspended or whose license has been revoked, except as provided in WAC 296-52-423;

(c) Any person who has been convicted in this state or elsewhere of a violent offense as defined in RCW 9.94A.030, perjury, false swearing, or bomb threats or a crime involving a schedule I or II controlled substance, or any other drug or alcohol related offenses, unless such other drug or alcohol related offense does not reflect a drug or alcohol dependency.

Exception: The director of labor and industries may issue a license if the person suffering a drug or alcohol related dependency is participating in or has completed an alcohol or drug recovery program acceptable to the department of labor and industries and has established control of their alcohol or drug dependency. The director of labor and industries shall require the applicant to provide proof of such participation and control.

(d) Any person who has previously been adjudged to be mentally ill or insane, or to be incompetent due to any mental disability or disease and who has not at the time of application been restored to competency.

(e) The department shall not issue or reissue an explosives license to any individual who is physically handicapped or diseased to an extent that he or she cannot safely pursue or continue all normal aspects of an explosives occupation. Disqualifying physical impairments may include but are not limited to examples such as blindness, deafness, or subject to epileptic or diabetic seizures or coma.

(f) A license holder of any unexpired license(s) shall surrender such license(s) to the department upon request for identified cause. Such surrender is subject to appeal to refute the contention of cause with verification of physical ability by a qualified physician.

Note: See also WAC 296-52-425 and 296-52-433.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-421, filed 3/6/95, effective 4/20/95; 88-23-054 (Order 88-25), § 296-52-421, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-421, filed 5/6/86.]

WAC 296-52-423 Revoking or suspending licenses.

(1) The department of labor and industries shall revoke and not renew the license of any person holding a manufacturer, dealer, purchaser, user, or storage license upon conviction of any of the following offenses, which conviction has become final:

(a) A violent offense as defined in RCW 9.94A.030;

(b) A crime involving perjury or false swearing, including the making of a false affidavit or statement under oath to the department of labor and industries in an application or report made pursuant to this title;

(c) A crime involving bomb threats;

(d) A crime involving a schedule I or II controlled substance, or any other drug or alcohol related offense,

unless such other drug or alcohol related offense does not reflect a drug or alcohol dependency.

Conditional exception: The department of labor and industries may issue a conditional renewal of the license to any convicted person suffering a drug or alcohol dependency who is participating in an alcoholism or drug recovery program acceptable to the department of labor and industries and has established control of their alcohol or drug dependency. The department of labor and industries shall require the applicant to provide proof of such participation and control.

(e) A crime relating to possession, use, transfer, or sale of explosives under this chapter or any other chapter of the Revised Code of Washington.

(2) The department of labor and industries shall revoke the license of any person adjudged to be mentally ill or insane, or to be incompetent due to any mental disability or disease. The director shall not renew the license until the person has been restored to competency.

(3) The department of labor and industries is authorized to suspend, for a period of time not to exceed six months, the license of any person who has violated this chapter or the rules promulgated pursuant to this chapter.

(4) The department of labor and industries may revoke the license of any person who has repeatedly violated this chapter or the rules promulgated pursuant to this chapter, or who has twice had his or her license suspended under this chapter.

(5) Upon receipt of notification by the department of labor and industries of revocation or suspension, a licensee must surrender immediately to the department any or all such licenses revoked or suspended. License fees will not be refunded for any licenses which are revoked for cause.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-423, filed 3/6/95, effective 4/20/95; 88-23-054 (Order 88-25), § 296-52-423, filed 11/14/88.]

WAC 296-52-425 Dealer's license. (RCW 70.74.130 and 70.74.230, apply.)

(1) The application for a dealer's license to buy explosives for the sole purpose of resale shall be made to Department of Labor and Industries, Olympia.

(2) Original license applications and/or application for renewal shall be completed on forms available from the department and shall comply with all requirements of WAC 296-52-421. The license fee shall be thirty-seven dollars and shall increase to fifty dollars two years after the effective date of this section.

(3) The license shall be renewed annually, no later than the expiration date.

(4) When an order for explosives is placed in person, by telephone, or in writing by a purchaser, the seller shall request proper authorization and identification from the purchaser and shall record the purchaser's license number.

(5) A dealer shall not distribute explosive materials to a company or individual on the order of a person who does not appear on the up to date list of representatives or agents and if the person does appear on the list, the dealer shall verify the identity of such person.

Exception: The above regulation(s) shall not apply to licensed common carrier companies when said common carrier is not purchasing the explosives but is merely transferring the materials from the seller to the purchaser and the transfer practices comply with current state and federal DOT regulations.

(6) Dealers records.

(a) A dealer's record of all explosives purchased and sold as defined in RCW 70.74.010, shall be kept on file and a copy transmitted not later than the tenth of every month to the department.

(b) The purchaser's name and license number shall be stated on dealer's record, and the name of the person authorized by the purchaser to physically receive the explosives.

(c) The dealer shall ascertain the identity of the individual who receives the explosives from a picture-type identification card, such as a driver's license. The recipient shall sign a receipt, documenting the explosives received and said receipt shall be retained by the dealer for not less than one year from the date of purchase.

(7) Any package, cask, or can containing any explosive, nitroglycerin, dynamite, or powder that is put up for sale, or is delivered to any warehouseman, dock, depot, or common carrier shall be properly labeled thereon to indicate its explosive classification.

(8) If the explosives are delivered by the dealer or dealer's authorized agent to an explosives magazine, the license number of said magazine and the legal signature of the recipient, properly authorized and identified, shall be obtained.

(9) No person shall sell, display, or expose for sale any explosive, improvised device or blasting agent on any highway, street, sidewalk, public way, or public place.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-425, filed 3/6/95, effective 4/20/95; 88-23-054 (Order 88-25), § 296-52-425, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-425, filed 5/6/86.]

WAC 296-52-429 License for manufacturing. RCW 70.74.110 and 70.74.144, apply.

(1) No person, partnership, firm, company or corporation shall manufacture explosives or blasting agents or use any process involving explosives as a component part in the manufacture of any device, article or product without first obtaining a manufacturer's license from the department of labor and industries.

(2) The application for license for manufacturing explosives and/or blasting agents shall be made to Department of Labor and Industries, Division of Consultation and Compliance, Olympia. The license fee for either an original license or a renewal shall be thirty-seven dollars and shall increase to fifty dollars two years after the effective date of this section.

(3) The application for original license or renewal shall be completed on forms available from the department and shall provide the following information:

(a) Location of place of manufacture or processing;

(b) Kind of explosives manufactured, processed, or used;

(c) The distance that such explosives manufacturing building is located or intended to be located from the other

factory buildings, magazines, inhabited buildings, railroads, highways, and public utility transmission systems;

(d) The name and address of the applicant;

(e) The reason for desiring to manufacture explosives;

(f) The applicant's citizenship, if the applicant is an individual;

(g) If the applicant is a partnership, the names and addresses of the partners and their citizenship;

(h) If the applicant is an association or corporation, the names and addresses of the officers and directors thereof, and their citizenship; and

(i) Such other pertinent information as the director of labor and industries shall require to effectuate the purpose of this chapter.

(4) Each application for license shall be accompanied by a site plan of the proposed or existing manufacturing facilities. The plan shall show:

(a) The distance each manufacturing building is located from other buildings on the premises where people are employed, from other occupied buildings on adjoining property, from buildings where customers are served, from public highways and utility transmission systems.

(b) The site plan shall demonstrate compliance with all applicable requirements of chapter 70.74 RCW, the State Explosives Act as it exists at the time of this adoption or is hereafter amended; with applicable requirements of chapter 296-50 WAC, Safety standards—Manufacture of explosives; with the separation/location requirements of this chapter.

(c) The site plan shall identify and describe all natural or artificial barricades which are utilized to influence minimum permissible separation distances.

(d) The site plan shall identify the nature of and kind of work carried on in each building.

(e) The site plan shall specify the maximum amount and kind of explosives or blasting agents which will be permitted in each building or magazine at any one time.

(5) The application for license shall comply with all requirements of WAC 296-52-421.

(6) Upon receipt of a completed application meeting all requirements of this section, the department will schedule an inspection of the premises at the earliest time possible.

(7) The department will issue a license to the applicant(s) provided that:

(a) The required inspection confirms that the site plan is accurate and the facilities comply with applicable regulations of the department;

(b) The applicant(s) or operating superintendent and employees are sufficiently trained and experienced in the manufacture of explosives.

(8) A license to manufacture explosives and/or blasting agents shall be valid for not more than one year from the date of issue unless suspended or revoked by the department.

(9) A copy of the site plan and manufacturer's license shall be posted in the main office of each manufacturing plant.

(a) The site plan shall be maintained to reflect current status of manufacturing facilities, occupancy changes, etc.

(b) The department shall be notified when significant change occurs in the site plan. If the change is of such nature or magnitude as to make compliance with all requirements of this chapter questionable, the license holder shall consult with the department before changing the operations.

(10) Specific applicable requirements for the manufacture of explosives and blasting agents are codified and distributed in chapter 296-50 WAC, Safety standards—Manufacture of explosives.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-429, filed 3/6/95, effective 4/20/95; 88-23-054 (Order 88-25), § 296-52-429, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-429, filed 5/6/86.]

WAC 296-52-433 Purchaser's license. RCW 70.74.135 and 70.74.137, apply.

(1) No person, firm, partnership, or corporation and including public agencies, shall be permitted to purchase explosives or blasting agents without a valid license as issued by the department of labor and industries.

(2) Applicants desiring to purchase explosives or blasting agents, except hand loader components as defined in this chapter, shall make application for license to the department of labor and industries. Application forms may be obtained at all department district offices, and from explosives dealers.

(3) Applicants shall comply with all requirements of WAC 296-52-421 and shall have a current user (blaster) license issued by the department. The purchaser's license fee shall be ten dollars and shall increase to fifteen dollars two years after the effective date of this section.

(4) Applicants shall be required to furnish at least the following information:

(a) The location where explosives are to be used;

(b) The kind and amount of explosives to be used;

(c) The name and address of the applicant;

(d) The reason for desiring to use explosives;

(e) The citizenship of the applicant, if the applicant is an individual;

(f) If the applicant is a partnership, the names and addresses of the partners and their citizenship;

(g) If the applicant is an association or corporation, the names and addresses of the officers and directors thereof and their citizenship;

(h) Documented proof of ownership of a licensed storage magazine or a signed authorization to use another person's licensed magazine; or the purchaser shall sign a statement certifying that the explosives will not be stored.

(i) Such other pertinent information as the director of the department of labor and industries shall require to effectuate the purposes of this chapter.

(5) The department will grant a purchaser's license after all legal requirements have been fulfilled.

(6) The license is valid for one year from date of issuance.

(7) Purchaser shall, prior to ordering explosive materials, furnish the dealer a current list of the representatives or agents authorized to order explosive materials on their behalf showing the name, address, drivers license number or valid identification and date and place of birth. A copy of the list shall be submitted with the purchaser's application. The dealer and the department lists shall be updated as changes occur.

(8) The individual who physically receives the purchased explosives shall prove to the satisfaction of the dealer that he, personally, is the purchaser, or the person authorized by the purchaser to receive said purchased explosives. Such

authorization procedure shall be approved by the department. Said receiver of explosives shall identify himself properly and shall sign the dealer's record with his legal signature.

[Statutory Authority: Chapter 49.17 RCW, 95-07-014, § 296-52-433, filed 3/6/95, effective 4/20/95; 88-23-054 (Order 88-25), § 296-52-433, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-10-044 (Order 86-24), § 296-52-433, filed 5/6/86.]

WAC 296-52-437 User's (blaster's) license. RCW 70.74.020 and 70.74.142, apply.

(1) No person, firm, partnership, or corporation shall use, blast, or dispose of explosives and/or blasting agents unless in possession of a valid user's (blaster's) license issued by the department of labor and industries.

(2) The application for a user's (blaster's) license to use, blast or dispose explosives and blasting agents shall be made to Department of Labor and Industries, Division of Consultation and Compliance, Olympia.

(a) Application forms may be obtained at all department district offices, and from explosives dealers.

(b) The license is valid for one year from date of issuance. The license fee shall be ten dollars and shall increase to fifteen dollars two years after the effective date of this section.

(c) Applicants shall comply with all requirements of WAC 296-52-421.

(d) User (blaster) may be required to verify name of licensed purchaser, which will be confirmed and approved by the department.

(3) In addition to the submission of the application form, all new applicants, all applicants requesting change in classification of their license, and all applicants who have not renewed their user (blaster) license within sixty days of expiration will be required to submit a resume of successful blasting experience, properly witnessed, and to pass a written examination prepared and administered by the department.

(4) User (blaster) qualifications:

(a) A user (blaster) shall be able to understand and give written and oral orders.

(b) A user (blaster) shall be in good physical condition and not be addicted to narcotics, intoxicants, or similar types of drugs. This rule does not apply to persons taking prescription drugs and/or narcotics as directed by a physician providing such use shall not endanger the worker or others.

(c) A user (blaster) shall be qualified by reason of training, knowledge, and experience, in the field of transporting, storing, handling, and use of explosives, and have a working knowledge of state and local laws and regulations which pertain to explosives.

(d) User (blaster) shall be required to furnish satisfactory evidence of competency in handling explosives and performing in a safe manner the type of blasting that will be required.

(e) The user (blaster) shall be knowledgeable and competent in the use of each type of blasting method used.

(5) The department will issue a user's license card which shall state the limitations imposed on the licensee and shall be presented by the user to authorized persons, upon request, together with valid personal identification.

(6) A "hand loader" as defined in this chapter, does not require a user's license.

[Statutory Authority: Chapter 49.17 RCW, 95-07-014, § 296-52-437, filed 3/6/95, effective 4/20/95; 88-23-054 (Order 88-25), § 296-52-437, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-10-044 (Order 86-24), § 296-52-437, filed 5/6/86.]

WAC 296-52-441 Storage magazine license requirements. RCW 70.74.120, applies.

(1) All explosives or blasting agents as defined in this chapter shall be kept or stored in magazines licensed by the department and which comply with the construction, location, and security requirements established by this chapter.

(2) Any person engaged in keeping or storing explosives or blasting agents shall make application to the department for an operating license for each storage magazine before engaging in the activity of keeping or storing explosives or blasting agents. Applications shall be made to the Department of Labor and Industries, Division of Consultation and Compliance, Olympia, WA 98504.

(3) License applicants shall meet the requirements of WAC 296-52-421.

(4) License applicants or the officers, agents, or employees of the applicant shall demonstrate sufficient experience in the handling of explosives, including the storage requirements for the different types of explosives or blasting agents to be stored.

(5) Each application shall include the following information:

(a) The name and address of the applicant;

(b) The reason for desiring to store or possess explosives;

(c) The citizenship of the applicant if the applicant is an individual;

(d) If the applicant is a partnership, the names and addresses of the partners and their citizenship;

(e) If the applicant is an association or corporation, the names and addresses of the officers and directors thereof and their citizenship;

(f) The location of the magazine, if then existing, or in case of a new magazine, the proposed location of such magazine;

(g) The kind of explosives that are kept or stored or possessed or intended to be kept or stored or possessed and the maximum quantity that is intended to be kept or stored or possessed thereat;

(h) The distance that such magazine is located or intended to be located from other magazines, inhabited buildings, explosives manufacturing buildings, railroads, highways, and public utility transmission systems;

(i) And such other pertinent information as the director of the department of labor and industries shall require to effectuate the purpose of this chapter.

(6) A license number shall be permanently affixed on the inside and outside of each storage magazine. This license number will stay with each magazine during its life.

(7) If the magazine is used or leased by a person other than the owner, such other person shall then be responsible for the safe operation of the magazine, and for obtaining of the license.

When the responsibility for a magazine is transferred from one person to another, the transferor shall immediately notify the department, stating the magazine license number.

The transferee shall execute a new application and pay the fee for one year, based on WAC 296-52-449.

(8) When a magazine is moved, altered or destroyed, the responsible person shall notify the department stating the magazine license number. When a magazine is altered, the alterations made shall be stated.

The moving of a magazine on a job site within a reasonable distance from its original location stated on the application is permitted without notifying the department; provided, that the new location complies with the Explosives Act and Explosives Code, and that the magazine can be quickly located for an inspection.

(9) Licenses will be issued pursuant to the procedures identified in WAC 296-52-445. The license fees are published in WAC 296-52-449.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-441, filed 3/6/95, effective 4/20/95; 88-23-054 (Order 88-25), § 296-52-441, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-441, filed 5/6/86.]

WAC 296-52-449 Storage magazine license fees.
RCW 70.74.140, applies.

The annual license fee for operating each magazine has been established by the department and shall be as shown in the following table:

Maximum weight (pounds) of explosives permitted in each magazine	Maximum number of blasting caps permitted in each magazine	Annual fee (dollars) for each magazine
200	133,000	20.00
1,000	667,000	35.00
5,000	3,335,000	50.00
10,000	6,670,000	60.00
50,000	33,350,000	75.00
Max. 300,000	Max. 200,000,000	100.00

Any permanent magazine licensed for two years shall pay twice the license fee shown.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-449, filed 3/6/95, effective 4/20/95; 88-23-054 (Order 88-25), § 296-52-449, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-449, filed 5/6/86.]

WAC 296-52-453 Construction of magazines. (1) Construction of all explosive storage magazines must comply with Washington state and Bureau of Alcohol, Tobacco, and Firearms regulations.

(2) Construction of permanent storage facilities.

(a) General. A Class 1 storage facility shall be a permanent structure; a building, an igloo or army-type structure, a tunnel, or a dugout. It shall be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and well ventilated.

(b) Buildings. All building type storage facilities shall be constructed of masonry, wood, metal, or a combination of these materials and shall have no openings except for entrances and ventilation. Ground around such storage facilities shall slope away for drainage.

(c) Masonry wall construction. Masonry wall construction shall consist of brick, concrete, tile, cement block, or cinder block and shall be not less than 6 inches in thickness.

Hollow masonry units used in construction shall have all hollow spaces filled with well tamped coarse dry sand or weak concrete (a mixture of one part cement and eight parts of sand with enough water to dampen the mixture while tamping in place). Interior wall shall be covered with a nonsparking material.

(d) Fabricated metal wall construction. Metal wall construction shall consist of sectional sheets of steel or aluminum not less than number 14 gauge, securely fastened to a metal framework. Such metal wall construction shall be either lined inside with brick, solid cement blocks, hardwood not less than 4 inches in thickness or material of equivalent strength, or shall have at least a 6 inch sand fill between interior and exterior walls. Interior walls shall be constructed of or covered with a nonsparking material.

(e) Wood frame wall construction. The exterior of outer wood walls shall be covered with iron or aluminum not less than number 26 gauge. An inner wall of nonsparking materials shall be constructed so as to provide a space of not less than 6 inches between the outer and inner walls, which space shall be filled with coarse dry sand or weak concrete.

(f) Floors. Floors shall be constructed of a nonsparking material and shall be strong enough to bear the weight of the maximum quantity to be stored.

(g) Foundations. Foundations shall be constructed of brick, concrete, cement block, stone, or wood posts. If piers or posts are used, in lieu of a continuous foundation, the space under the buildings shall be enclosed with metal.

(h) Roof.

(i) Except for buildings with fabricated metal roofs, the outer roof shall be covered with no less than number 26-gauge iron or aluminum fastened to a 7/8-inch sheathing.

(ii) Where it is possible for a bullet to be fired directly through the roof and into the storage facility at such an angle that the bullet would strike a point below the top of inner walls, storage facilities shall be protected by one of the following methods:

(A) A sand tray shall be located at the tops of inner walls covering the entire ceiling area, except that necessary for ventilation, lined with a layer of building paper, and filled with not less than 4 inches of coarse dry sand.

(B) A fabricated metal roof shall be constructed of 3/16-inch plate steel lined with 4 inches of hardwood or material of equivalent strength (for each additional 1/16-inch of plate steel, the hardwood or material of equivalent strength lining may be decreased one inch).

(i) Doors. All doors shall be constructed of 1/4-inch plate steel and lined with 2 inches of hardwood or material of equivalent strength. Hinges and hasps shall be attached to the doors by welding, riveting or bolting (nuts on inside of door). They shall be installed in such a manner that the hinges and hasps cannot be removed when the doors are closed and locked.

(j) Locks. Each door shall be equipped with two mortise locks; or with two padlocks fastened in separate hasps and staples; or with a combination of mortise lock and a padlock, or with a mortise lock that requires two keys to open; or a three-point lock. Padlocks shall have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks shall be protected with not less than 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements

do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(k) Ventilation. Except at doorways, a 2-inch air space shall be left around ceilings and the perimeter of floors. Foundation ventilators shall be not less than 4 by 6 inches. Vents in the foundation, roof, or gables shall be screened and offset.

(l) Exposed metal. No sparking metal construction shall be exposed below the top of walls in the interior of storage facilities, and all nails therein shall be blind-nailed, countersunk or nonsparking.

(m) Igloos, army-type structures, tunnels and dugouts. Storage facilities shall be constructed of reinforced concrete, masonry, metal or a combination of these materials. They shall have an earthmound covering of not less than 24 inches on the top, sides and rear unless the magazine meets the requirements of (h)(ii) of this subsection. Interior walls and floors shall be covered with a nonsparking material. Storage facilities of this type shall also be constructed in conformity with the requirements of subsection (1)(a), (b), (f), (i), (j), (k) and (l) of this section.

(3) Construction of portable (field) storage facilities.

(a) General. A Class 2 storage facility shall be a box, a trailer, a semitrailer or other mobile facility. It shall be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and well ventilated. Portable magazines shall be at least one cubic yard in size. The floor shall be supported to prevent direct contact with the ground. The ground around magazines shall slope away for drainage or other adequate drainage provided. When unattended, vehicular magazines shall have wheels removed or otherwise effectively immobilized by kingpin locking devices or other methods approved by the department.

(b) Construction. The exterior and doors shall be constructed of not less than 1/4-inch steel and lined with at least two inches of hardwood. Magazines with top openings shall have lids with water-resistant seals or shall overlap the sides by at least one inch when in a closed position.

(c) Hinges and hasps. Hinges and hasps shall be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

(d) Locks. Each door shall be equipped with two mortise locks; or with two padlocks fastened in separate hasps and staples; or with a combination of mortise lock and a padlock, or with a mortise lock that requires two keys to open; or a three-point lock. Padlocks shall have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks shall be protected with not less than 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(e) Ventilation. Except at doorways, a 2-inch air space shall be left around ceilings and the perimeter of floors. Foundation ventilators shall be not less than 4 by 6 inches. Vents in the foundation, roof, or gables shall be screened and offset.

(f) Exposed metal. No sparking metal construction shall be exposed below the top of walls in the interior of storage facilities and all nails therein shall be blind-nailed, countersunk, or nonsparking.

Note: The following alternatives may be used. (All steel and wood dimensions indicated are actual thicknesses. To meet the concrete block and brick dimensions indicated, the manufacturer's represented thicknesses may be used.)

(i) Exterior of 5/8-inch steel, lined with an interior of any type of nonsparking material.

(ii) Exterior of 1/2-inch steel, lined with an interior of not less than 3/8-inch plywood.

(iii) Exterior of 3/8-inch steel, lined with an interior of two inches of hardwood.

(iv) Exterior of 3/8-inch steel, lined with an interior of three inches of softwood or 2-1/4-inches of plywood.

(v) Exterior of 1/4-inch steel, lined with an interior of five inches of softwood or 5-1/4-inches of plywood.

(vi) Exterior of 3/16-inch steel, lined with an interior of four inches of hardwood.

(vii) Exterior of 3/16-inch steel, lined with an interior of seven inches of softwood or 6-3/4-inches of plywood.

(viii) Exterior of 3/16-inch steel, lined with an intermediate layer of three inches of hardwood and an interior lining of 3/4-inch plywood.

(ix) Exterior of 1/8-inch steel, lined with an interior of five inches of hardwood.

(x) Exterior of 1/8-inch steel, lined with an interior of nine inches of softwood.

(xi) Exterior of 1/8-inch steel, lined with an intermediate layer of four inches of hardwood and an interior lining of 3/4-inch plywood.

(xii) Exterior of any type of fire-resistant material which is structurally sound, lined with an intermediate layer of four inches solid concrete block or four inches solid brick or four inches of solid concrete, and an interior lining of 1/2-inch plywood placed securely against the masonry lining.

(xiii) Standard eight-inch concrete block with voids filled with well-tamped sand/cement mixture.

(xiv) Standard eight-inch solid brick.

(xv) Exterior of any type of fire-resistant material which is structurally sound, lined with an intermediate six-inch space filled with well-tamped dry sand or well-tamped sand/cement mixture.

(xvi) Exterior of 1/8-inch steel, lined with a first intermediate layer of 3/4-inch plywood, a second intermediate layer of 3-5/8-inches well-tamped dry sand or sand/cement mixture and an interior lining of 3/4-inch plywood.

(xvii) Exterior of any type of fire-resistant material, lined with a first intermediate layer of 3/4-inch plywood, a second intermediate layer of 3-5/8-inch well-tamped dry sand or sand/cement mixture, a third intermediate layer of 3/4-inch plywood, and a fourth intermediate layer of two inches of hardwood or 14-gauge steel and an interior lining of 3/4-inch plywood.

(xviii) Eight-inch thick solid concrete.

(4) Construction of detonator (blasting cap) indoor storage facilities.

Note: BATF regulations § 55.208(b) permits an indoor (federal) type 2 magazine to contain up to 50 pounds of high explosives or up to 5,000 caps (detonators) provided that no magazine for explosives storage may be located in a residence or dwelling (as

defined). The department of labor and industries calculates 1,000 standard No.8 caps (detonators) as the equivalency of 1-1/2 pounds high explosives. This chapter permits a (state) type 3 indoor storage magazine for up to 1,000 No. 8 caps to be located within access controlled buildings such as warehouses, shops, and maintenance buildings, but specifically excluding any residence or dwelling, provided that the building shall comply with all applicable Washington Administrative Code and NFPA requirements and the magazine shall be constructed in compliance with this section.

(a) General. Class 3 storage facility for detonators (blasting caps) in quantities of 1,000 or less shall be fire-resistant and theft-resistant. They need not be bullet-resistant and weather-resistant if the locked uninhabited building in which they are stored provide protection from the weather and from bullet penetration.

(b) Construction. Sides, bottoms and covers shall be constructed of not less than number 12-gauge metal and lined with a nonsparking material.

(c) Hinges and hasps shall be attached so they cannot be removed from the outside.

(d) Locks. One steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter is sufficient for locking purposes.

(i) A magazine for indoor cap storage is not required to be at least 1 cubic yard in size provided that it is otherwise constructed in compliance with the requirements of this section.

(ii) Class 3 magazines, when located indoors, shall be painted red and appropriately labeled for ready identification in case of fire.

(5) Construction of blasting agent, low explosive or electric blasting cap storage facilities.

(a) General. A Class 4 storage facility may be a building, an igloo, or army-type structure, a tunnel, a dugout, a box, a trailer, or a semitrailer or other mobile facility. They shall be fire-resistant, weather-resistant and theft-resistant. The ground around such storage facilities shall slope away for drainage. When unattended, vehicular storage facilities shall have wheels removed or otherwise effectively immobilized by kingpin locking devices or other methods approved by the department.

Note: As a result of tests with electric blasting caps, it has been determined that these blasting caps are not subject to sympathetic detonation. Therefore, a Class 4 storage facility meets the necessary requirements for storage of electric blasting caps.

(b) Construction. These magazines shall be constructed of masonry, metal-covered wood, fabricated metal, or a combination of these materials. Foundations are to be constructed of brick, concrete, cement block, stone, or metal or wood posts. If piers or posts are used, in lieu of a continuous foundation, the space under the building shall be enclosed with fire-resistant material. The walls and floors are to be constructed of, or covered with, a nonsparking material or lattice work. The doors shall be metal or solid wood covered with metal.

(c) Hinges and hasps. Hinges and hasps shall be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

(d) Locks. Each door shall be equipped with two mortise locks; or with two padlocks fastened in separate hasps and staples; or with a combination of mortise lock and a padlock, or with a mortise lock that requires two keys to open; or a three-point lock. Padlocks shall have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks shall be protected with not less than 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(6) Construction of blasting agent storage facilities.

(a) General. A Class 5 storage facility may be a building, igloo or army-type structure, tunnel, dugout, bin, box, trailer, or a semitrailer or other mobile facility. They shall be weather-resistant and theft-resistant. The ground around such storage facilities shall slope away for drainage. When unattended, vehicular storage facilities shall have wheels removed or otherwise effectively immobilized by kingpin locking devices or other methods approved by the department.

(b) Construction. The doors shall be constructed of solid wood or metal.

(c) Hinges and hasps. Hinges and hasps shall be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps shall be installed so that they cannot be removed when the doors are closed and locked.

(d) Locks. Each door shall be equipped with two mortise locks; or with two padlocks fastened in separate hasps and staples; or with a combination of mortise lock and a padlock, or with a mortise lock that requires two keys to open; or a three-point lock. Padlocks shall have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks shall be protected with not less than 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples.

Note: Trailers, semitrailers, and similar vehicular magazines may, for each door, be locked with one steel padlock (which need not be protected by a steel hood) having at least 3/8-inch diameter, if the door hinges and lock hasp are securely fastened to the magazine and to the door frame. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(7) Construction of day box storage facilities for explosives.

(a) General. A temporary storage facility shall be a day box. It must be fire-resistant, weather-resistant and theft-resistant. The ground around such storage facilities shall slope away for drainage.

(b) Construction. A day box shall be constructed of not less than number 12-gauge (.1046 inches) steel, lined with at least either 1/2-inch plywood or 1/2-inch Masonite-type hardboard. Doors shall overlap sides by at least one inch.

(c) Hinges and hasps. Hinges and hasps are to be attached by welding, riveting or bolting (nuts on inside).

(d) Locks. One steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter is sufficient for locking purposes.

(e) Unattended storage. No explosive materials shall be left in a day box if unattended. The explosive materials contained therein shall be removed to licensed storage facilities for unattended storage.

(8) Construction of day box storage facilities for detonators (blasting caps).

(a) General. Temporary storage facilities for blasting caps in quantities of 1,000 or less.

(b) Construction. Sides, bottoms and covers shall be constructed of number 12-gauge metal and lined with a nonsparking material.

(c) Hinges and hasps shall be attached thereto by welding.

(d) Locks. A single five-tumbler proof lock shall be sufficient for locking purposes.

(e) No explosive materials shall be left in such facilities if unattended. The explosive materials contained therein shall be removed to licensed storage facilities for unattended storage.

(9) Magazine heating systems requirements, NFPA Code No. 495, "Manufacture, Transportation, Storage and Use of Explosive Materials, 1992," and the following will apply:

(a) Magazines requiring heat shall be heated by either hot water radiant heating within the magazine building; or air directed into the magazine building over either hot water or low pressure steam (15 psig) coils located outside the magazine building.

(b) The magazine heating systems shall meet the following requirements:

(i) The radiant heating coils within the building shall be installed in such a manner that the explosive materials or their containers cannot contact the coils and air is free to circulate between the coils and the explosive materials or their containers.

(ii) The heating ducts shall be installed in such a manner that the hot air discharge from the duct is not directed against the explosive materials or their containers.

(iii) The heating device used in connection with a magazine shall have controls which prevent the ambient building temperature from exceeding 130°F.

(iv) The electric fan or pump used in the heating system for a magazine shall be mounted outside and separate from the wall of the magazine and shall be grounded.

(v) The electric fan motor and the controls for electrical heating devices used in heating water or steam shall have overloads and disconnects, which comply with the National Electrical Code, (National Fire Protection Association, NFPA No. 70-1992). All electrical switch gear shall be located a minimum distance of 25 feet from the magazine.

(vi) The heating source for water or steam shall be separated from the magazine by a distance of not less than 25 feet when electrical and 50 feet when fuel-fired. The area between the heating unit and the magazine shall be cleared of all combustible materials.

(vii) The storage of explosive materials and their containers in the magazine shall allow uniform air circulation so temperature uniformity can be maintained throughout the explosive materials.

(10) Lighting.

(a) Battery-activated safety lights or battery-activated safety lanterns may be used in explosives storage magazines.

(b) Electric lighting used in any explosives storage magazine shall meet the standards prescribed by the "National Electrical Code," (National Fire Protection Association, NFPA 70-1992), for the conditions present in the magazine at any time. All electrical switches shall be located outside of the magazine and also meet the standards prescribed by the National Electrical Code.

[Statutory Authority: Chapter 49.17 RCW, 95-07-014, § 296-52-453, filed 3/6/95, effective 4/20/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-453, filed 5/6/86.]

WAC 296-52-461 Storage of explosives. (1) General.

(a) All Class A, Class B, Class C explosives, and special industrial explosives, and any newly developed and unclassified explosives, shall be kept in magazines which meet the requirements as defined in chapter 70.74 RCW and chapter 296-52 WAC, unless they are in the process of manufacture, being physically handled in the operating process, being used or being transported to a place of storage or use. No explosives and no detonators (blasting caps) in quantities of 1,001 or more shall be stored in any building or structure except a Class 1, permanent, magazine that has been approved and licensed.

Note 1: Separate storage of components capable of detonation when mixed. Any two components which, when mixed, become capable of detonation by a number 6 cap must be stored in separate locked containers or in a licensed, approved magazine.

Note 2: Electromagnetic radiation. Blasting operations or storage of electrical detonators shall be prohibited in vicinity of operating radio frequency (RF) transmitter stations except where the clearances, as referenced in WAC 296-52-493(g), can be observed.

Note 3: Blasting caps, electric blasting caps, detonating primers and primed cartridges shall not be stored in the same magazine with other explosives.

(b) Subsection (1) of this section does not apply to:

(i) Stocks of small arms ammunition, propellant-actuated power cartridges, small arms ammunition primers in quantities of less than 750,000, smokeless propellants in quantities of less than 150 pounds or black powder, as used in muzzle loading firearms, in quantities of less than 25 pounds;

(ii) Explosive-actuated power devices when in quantities less than 50 pounds net weight of explosives;

(iii) Fuse lighters and fuse igniters;

(iv) Safety fuses other than cordeau detonant fuses.

(2) Quantity restrictions. Explosive materials in excess of 300,000 pounds or blasting caps in excess of 20,000,000 shall not be stored in one storage magazine.

(3) Inventory and responsibility.

(a) Magazines shall be in the charge of a qualified person at all times who shall be at least twenty-one years of age, and who shall be held responsible for the enforcement of all safety precautions.

(b) All explosives shall be accounted for at all times. Explosives not being used shall be kept in a locked magazine, unavailable to persons not authorized to handle them. The employer shall maintain an inventory and use record of all explosives.

(c) Any person or company storing explosive material shall inspect their magazine at least every seven days. This inspection need not be an inventory, but must be sufficient to determine whether there has been unauthorized entry or

attempted entry into the magazines or unauthorized removal of the contents of the magazines.

(i) The person conducting weekly inspection must be familiar with the magazine being inspected and the contents.

(ii) The inspecting person shall date and sign the inspection log, inventory sheet or other record upon completion of each inspection.

(iii) The proof of weekly inspection shall be maintained for not less than one year.

(d) A person who knows of a theft or loss of explosives for which that person is responsible under this chapter shall report the theft or loss to the local law enforcement agency within twenty-four hours of discovery of the theft or loss. The local law enforcement agency shall immediately report the theft or loss to the department of labor and industries.

It is recommended that any person who knows of an attempted unauthorized entry should report same to the local law enforcement agency.

(4) Surrounding area.

(a) Firearms (except firearms carried by qualified guards and qualified law enforcement officers) shall not be permitted inside of or within 50 feet of magazines.

**DANGER: EXPLOSIVES
STORAGE AREA. KEEP
OUT. NO SHOOTING.
DO NOT FIGHT
EXPLOSIVE FIRES.
PHONE: _____**

Note: The phone number should be that of the individual or company responsible for the contents of the magazine.

Approved U.S. Department of Transportation placards must remain on Class 5 trailers, containing blasting agents while unattended.

(6) Temporary storage at a site for blasting operations shall be located away from neighboring inhabited buildings, railways, highways, and other magazines. A distance of at least one hundred and fifty feet shall be maintained between magazines and the work in progress when the quantity of explosives kept therein is in excess of 25 pounds, and at least 50 feet when the quantity of explosives is 25 pounds or less.

(7) Explosives recovered from blasting misfires shall be placed separately in an approved magazine until competent personnel have determined from the manufacturer the method of disposal. Suspected defective caps recovered from blasting misfires shall not be reused. Such explosives and caps shall then be disposed of in the manner recommended by the manufacturer.

(8) Storage within magazines.

(a) Explosives which are not conspicuously age date marked by the manufacturer shall be marked with the manufacturing date before being stored in the magazine.

(b) The area surrounding magazines is to be kept clear of rubbish, brush, dry grass, or trees (except of live trees more than 10 feet tall), for not less than 25 feet in all directions.

(c) Volatile materials are to be kept a distance of not less than 50 feet from outdoor magazines. Living foliage which is used to stabilize earthen covering of a magazine need not be removed.

(d) Smoking, matches, open flames, and spark-producing devices are not permitted:

(i) In any magazine;

(ii) Within 50 feet of any outdoor magazine; or

(iii) Within any room containing an indoor magazine.

(5) Signs. The premises on which a magazine is located shall be conspicuously marked with signs as illustrated below. Such signs shall warn any person approaching the magazine of the presence of explosives, but shall be so located that a bullet passing directly through the face of the sign will not strike the magazine.

Letters: 3" high X 2" wide

Reflectorized finish
White background with
Red letters

Note: Unidentified explosives confiscated by law enforcement may be marked with the confiscation date if the manufacturer's date is unknown.

(b) Explosive materials within a magazine shall not be placed directly against interior walls, and must not be stored so as to interfere with ventilation. To prevent contact of stored explosive materials with the interior walls, a nonsparking lattice work or other nonsparking material may be used.

(c) Packages of explosives shall be laid flat with the top side up and shall be piled in a stable manner.

Exception: Nitroglycerin based dynamite in long-term storage may be inverted (turned top down) at intervals recommended by the product manufacturer.

(d) Corresponding grades and brands shall be stored together in such a manner that brands and grade marks show. All stocks shall be stored so as to be easily counted and checked.

(e) Black powder when stored in magazines with other explosives shall be stored separately. Black powder stored in kegs shall be stored on ends, bungs down, or on side, seams down.

(f) When any kind of explosive is removed from a magazine for use, the oldest explosive of that particular kind shall always be taken first.

(g) Except with respect to fiberboard or other nonmetal containers, containers of explosives shall not be unpacked or repacked in a magazine nor within 50 feet of a magazine or in close proximity to other explosives.

(h) Tools used for opening packages of explosives shall be constructed of nonsparking materials, except that nonsparking metallic slitters may be used for opening fiberboard boxes. A wood wedge and a fiber, rubber, or wood mallet shall be used for opening or closing wood packages of explosives. Opened packages of explosives shall be securely closed before being returned to a magazine.

(i) Magazines shall not be used for the storage of any metal tools nor any commodity except explosives, blasting agents and blasting supplies.

(j) Magazine floors shall be regularly swept, kept clean, dry, free of grit, paper, empty used packages, and rubbish. Brooms and other cleaning utensils shall not have any spark-producing metal parts. Sweepings from floors of magazines shall be properly disposed of. Magazine floors stained with nitroglycerin shall be cleaned according to instructions by the manufacturer.

(k) When any explosive has deteriorated to an extent that it is in an unstable or dangerous condition, or if nitroglycerin leaks from any explosives, then the person in possession of such explosive shall immediately proceed to destroy such explosive in accordance with the instructions of the manufacturer. Only experienced persons shall be allowed to do the work of destroying explosives.

(l) Magazine repairs.

(i) All explosives shall be removed from the magazine and the floor shall be cleaned before commencing repairs inside a magazine.

(ii) When making outside repairs on a magazine and the work could cause sparks or fire, all explosives shall be removed from the magazine before commencing repair activities.

(iii) Explosives removed from a magazine under repair shall be placed in another magazine or placed a safe distance from the magazine under repair and shall be properly attended until returned to the magazine.

(9) Underground storage.

(a) Explosives and related materials shall be stored in approved facilities required under the provisions of chapter 296-52 WAC.

(b) No explosives or blasting agents shall be permanently stored in any underground operation until the operation has been developed to the point where at least two modes of exit have been developed.

(c) Permanent underground storage magazines shall be at least 300 feet from any shaft, adit, or active underground working area.

(d) Permanent underground magazines containing detonators shall not be located closer than 50 feet to any magazine containing other explosives or blasting agents.

(e) Upon the approach of an electrical storm, unless a greater hazard would be created thereby, explosives at the adit or the top of any shaft leading to where persons are working shall be moved away from such location a distance

equal to that required for inhabited buildings, as listed in Table H-20.

(10) All explosive manufacturing buildings and magazines in which explosives or blasting agents, except small arms ammunition and smokeless powder are had, kept, or stored, must be located at distances from inhabited buildings, railroads and highways in conformity with the following quantity and distance tables, and these tables shall be the basis on which applications for license for storage shall be made and license for storage issued, as provided in RCW 70.74.110 and 70.74.120. Blasting and electric blasting caps in strength through number 8 shall be rated as one and one-half pounds of explosives per one thousand caps. Blasting and electric blasting caps of strength higher than number 8 shall be computed on the combined weight of explosives.

(11) When two or more storage magazines are located on the same property, each magazine must comply with the minimum distances specified from inhabited buildings, railways, and highways, and in addition, they should be separated from each other by not less than the distances shown for "separation of magazines", except that the quantity of explosives contained in cap magazines shall govern in regard to the spacing of said cap magazines from magazines containing other explosives. If any two or more magazines are separated from each other by less than the specified "separation of magazines" distances, then such two or more magazines, as a group, must be considered as one magazine, and the total quantity of explosives stored in such group must be treated as if stored in a single magazine located on the site of any magazine of the group, and must comply with the minimum of distances specified from other magazines, inhabited buildings, railways and highways.

Illustration, Table H-20

American Table of Distances for Storage of Explosives

Quantity of Explosives		Distances (in Feet)					
(In Pounds)		Inhabited Buildings		Public Highways Class A to D ₂		Passenger Railways and Public Highways: With Traffic Volume of More Than 3,000 Vehicles Per Day	
Over	Not Over	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded
2	5	70	140	30	60	51	102
5	10	90	180	35	70	64	128
10	20	110	220	45	90	81	162
20	30	125	250	50	100	93	186
30	40	140	280	55	110	103	206
40	50	150	300	60	120	110	220
50	75	170	340	70	140	127	254
75	100	190	380	75	150	139	278
100	125	200	400	80	160	150	300
125	150	215	430	85	170	159	318
150	200	235	470	95	190	175	350
200	250	255	510	105	210	189	378
250	300	270	540	110	220	201	402
300	400	295	599	120	240	221	442
400	500	320	640	130	260	238	476
500	600	340	680	135	270	253	506
600	700	355	710	145	290	266	532
700	800	375	750	150	300	278	556
800	900	390	780	155	310	289	578
900	1,000	400	800	160	320	300	600
1,000	1,200	425	850	165	330	318	636
1,200	1,400	450	900	170	340	336	672
1,400	1,600	470	940	175	350	351	702
1,600	1,800	490	980	180	360	366	732

Quantity of Explosives		Distances (in Feet)					
(In Pounds)		Inhabited Buildings		Public Highways Class A to D ₂		Passenger Railways and Public Highways: With Traffic Volume of More Than 3,000 Vehicles Per Day	
Over	Not Over	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded
1,800	2,000	505	1,010	185	370	378	756
2,000	2,500	545	1,090	190	380	408	816
2,500	3,000	580	1,160	195	390	432	864
3,000	4,000	635	1,270	210	420	474	948
4,000	5,000	685	1,370	225	450	513	1,026
5,000	6,000	730	1,460	235	470	546	1,092
6,000	7,000	770	1,540	245	490	573	1,146
7,000	8,000	800	1,600	250	500	600	1,200
8,000	9,000	835	1,670	255	510	624	1,248
9,000	10,000	865	1,730	260	520	645	1,290
10,000	12,000	875	1,750	270	540	687	1,374
12,000	14,000	885	1,770	275	550	723	1,446
14,000	16,000	900	1,800	280	560	756	1,512
16,000	18,000	940	1,880	285	570	786	1,572
18,000	20,000	975	1,950	290	580	813	1,626
20,000	25,000	1,055	2,000	315	630	876	1,752
25,000	30,000	1,130	2,000	340	680	933	1,866
30,000	35,000	1,205	2,000	360	720	931	1,962
35,000	40,000	1,275	2,000	380	760	1,026	2,000
40,000	45,000	1,340	2,000	400	800	1,068	2,000
45,000	50,000	1,400	2,000	420	840	1,104	2,000
50,000	55,000	1,460	2,000	440	880	1,140	2,000
55,000	60,000	1,515	2,000	455	910	1,173	2,000
60,000	65,000	1,565	2,000	470	940	1,206	2,000
65,000	70,000	1,610	2,000	485	970	1,236	2,000
70,000	75,000	1,655	2,000	500	1,000	1,263	2,000
75,000	80,000	1,695	2,000	510	1,020	1,293	2,000
80,000	85,000	1,730	2,000	520	1,040	1,317	2,000

Quantity of Explosives		Distances (in Feet)					
(In Pounds)		Inhabited Buildings		Public Highways Class A to D ₂		Passenger Railways and Public Highways: With Traffic Volume of More Than 3,000 Vehicles Per Day	
Over	Not Over	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded
85,000	90,000	1,760	2,000	530	1,060	1,344	2,000
90,000	95,000	1,790	2,000	540	1,080	1,368	2,000
95,000	100,000	1,815	2,000	545	1,090	1,392	2,000
100,000	110,000	1,835	2,000	550	1,100	1,437	2,000
110,000	120,000	1,855	2,000	555	1,110	1,479	2,000
120,000	130,000	1,875	2,000	560	1,120	1,521	2,000
130,000	140,000	1,890	2,000	565	1,130	1,557	2,000
140,000	150,000	1,900	2,000	570	1,140	1,593	2,000
150,000	160,000	1,935	2,000	580	1,160	1,629	2,000
160,000	170,000	1,965	2,000	590	1,180	1,662	2,000
170,000	180,000	1,990	2,000	600	1,200	1,695	2,000
180,000	190,000	2,010	2,010	605	1,210	1,725	2,000
190,000	200,000	2,030	2,030	610	1,220	1,755	2,000
200,000	210,000	2,055	2,055	620	1,240	1,782	2,000
210,000	230,000	2,100	2,100	635	1,270	1,836	2,000
230,000	250,000	2,155	2,155	650	1,300	1,890	2,000
250,000	275,000	2,215	2,215	670	1,340	1,950	2,000
275,000	300,000	2,275	2,275	690	1,380	2,000	2,000

*** Note 1: Terms used in Table H-20 are found in WAC 296-52-417.

Note 2: Source of Table data is BATF (6/90) §55-218.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-461, filed 3/6/95, effective 4/20/95; 92-17-022 (Order 92-06), § 296-52-461, filed 8/10/92, effective 9/10/92; 90-03-029 (Order 89-20), § 296-52-461, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-461, filed 5/6/86.]

WAC 296-52-465 Storage of ammonium nitrate.

(1) Scope and definitions.

(a) Except as provided in (d) of this subsection applies to the storage of ammonium nitrate in the form of crystals, flakes, grains, or prills including fertilizer grade, dynamite grade, nitrous oxide grade, technical grade, and other mixtures containing 60 percent or more ammonium nitrate by weight but does not apply to blasting agents.

(b) This section does not apply to the transportation of ammonium nitrate while such transportation is being con-

ducted under U.S. DOT jurisdiction and in compliance with DOT regulations (see 49 CFR Part 173).

(c) This section does not apply to storage under the jurisdiction of and in compliance with the regulations of the United States Coast Guard (see 46 CFR Parts 146-149).

(d) This section shall not apply to storage of ammonium nitrate and ammonium nitrate mixtures which are more sensitive than allowed by the "Definition and Test Procedures for Ammonium Nitrate Fertilizers" from the FERTILIZER INSTITUTE. Storage of ammonium nitrate which is above the sensitivity criteria shall comply with WAC 296-52-469, Storage of Blasting Agents and Supplies.

(e) Nothing in this section shall apply to the production of ammonium nitrate or to the storage of ammonium nitrate on the premises of the producing plant, provided that no distinct undue hazard to employees or the public is created.

(f) The definition and test procedures for ammonium nitrate fertilizer are those found in the bulletin, "Definition and test procedures for ammonium nitrate fertilizer," available from the Fertilizer Institute, 501 2nd St. N.E., Washington, D.C. 20006. This definition limits the contents of organic materials, metals, sulfur, etc., in a product that may be classified ammonium nitrate fertilizer.

(g) The standards for ammonium nitrate (nitrous oxide grade) are those found in the "specifications, properties, and recommendations for packaging, transportation, storage, and use of ammonium nitrate," available from the Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4100.

(2) General provisions.

(a) This subsection applies to all persons storing, having, or keeping ammonium nitrate, and to the owner or lessee of any building, premises, or structure in which ammonium nitrate is stored in quantities of 1,000 pounds (454 kg) or more.

(b) Approval of large quantity storage shall be subject to due consideration of the fire and explosion hazards, including exposure to toxic vapors from burning or decomposing ammonium nitrate.

(c) Storage buildings shall not have basements unless the basements are open on at least one side. Storage buildings shall not be over one story in height.

(d) Storage buildings shall have adequate ventilation or be of a construction that will be self-ventilating in the event of fire.

(e) The wall on the exposed side of a storage building within 50 feet (15.2 m) of a combustible building, forest, piles of combustible materials and similar exposure hazards shall be of fire-resistive construction. (See NFPA Std. 220, Type 1 Construction.) In lieu of the fire-resistive wall, other suitable means of exposure protection such as a free standing wall may be used. The roof coverings shall be Class C or better, as defined in Roof Coverings, NFPA 203M-1970.

(f) All flooring in storage and handling areas, shall be of noncombustible material or protected against impregnation by ammonium nitrate and shall be without open drains, traps, tunnels, pits, or pockets into which any molten ammonium nitrate could flow and be confined in the event of fire.

(g) The continued use of an existing storage building or structure not in strict conformity with this section may be approved in cases where such continued use will not constitute a hazard to life or adjoining property.

(h) Buildings and structures shall be dry and free from water seepage through the roof, walls, and floors.

(3) Storage of ammonium nitrate in bags, drums, or other containers.

(a) Bags and containers used for ammonium nitrate must comply with specifications and standards required for use in interstate commerce (see 49 CFR Chapter I).

(b) Containers used on the premises in the actual manufacturing or processing need not comply with provisions of (a) of this subsection.

(c) Containers of ammonium nitrate shall not be accepted for storage when the temperature of the ammonium nitrate exceeds 130°F (54.4°C).

(d) Bags of ammonium nitrate shall not be stored within 30 inches (76 cm) of the storage building walls and partitions.

(e) The height of piles shall not exceed 20 feet (6.1 m). The width of piles shall not exceed 20 feet (6.1 m) and the length 50 feet (15.2 m) except that where the building is of noncombustible construction or is protected by automatic sprinklers the length of piles shall not be limited. In no case shall the ammonium nitrate be stacked closer than 36 inches (0.9 m) below the roof or supporting and spreader beams overhead.

(f) Aisles shall be provided to separate piles by a clear space of not less than 3 feet (0.9 m) in width. At least one service or main aisle in the storage area shall be not less than 4 feet (1.2 m) in width.

(4) Storage of bulk ammonium nitrate.

(a) Warehouses shall have adequate ventilation or be capable of adequate ventilation in case of fire.

(b) Unless constructed of noncombustible material or unless adequate facilities for fighting a roof fire are available, bulk storage structures shall not exceed a height of 40 feet (12.2 m).

(c) Bins shall be clean and free of materials which may contaminate ammonium nitrate.

(d) Due to the corrosive and reactive properties of ammonium nitrate, and to avoid contamination, galvanized iron, copper, lead, and zinc shall not be used in a bin construction unless suitably protected. Aluminum bins and wooden bins protected against impregnation by ammonium nitrate are permissible. The partitions dividing the ammonium nitrate storage from other products which would contaminate the ammonium nitrate shall be of tight construction.

(e) The ammonium nitrate storage bins or piles shall be clearly identified by signs reading "ammonium nitrate" with letters at least 2 inches (5 cm) high.

(f) Piles or bins shall be so sized and arranged that all material in the pile is moved out periodically in order to minimize possible caking of the stored ammonium nitrate.

(g) Height or depth of piles shall be limited by the pressure-setting tendency of the product. However, in no case shall the ammonium nitrate be piled higher at any point than 36 inches (0.9 m) below the roof or supporting and spreader beams overhead.

(h) Ammonium nitrate shall not be accepted for storage when the temperature of the product exceeds 130°F (54.4°C).

(i) Dynamite, other explosives, and blasting agents shall not be used to break up or loosen caked ammonium nitrate.

(5) Contaminants.

(a) Ammonium nitrate shall be in a separate building or shall be separated by approved type firewalls of not less than 1 hour fire-resistance rating from storage or organic chemicals, acids, or other corrosive materials, materials that may require blasting during processing or handling, compressed flammable gases, flammable and combustible materials or other contaminating substances, including but not limited to animal fats, baled cotton, baled rags, baled scrap paper, bleaching powder, burlap or cotton bags, caustic soda, coal, coke, charcoal, cork, camphor, excelsior, fibers of any kind, fish oils, fish meal, foam rubber, hay, lubricating oil, linseed oil, or other oxidizable or drying oils, naphthalene, oakum,

oiled clothing, oiled paper, oiled textiles, paint, straw, sawdust, wood shavings, or vegetable oils. Walls referred to in this subsection need extend only to the underside of the roof.

(b) In lieu of separation walls, ammonium nitrate may be separated from the materials referred to in (a) of this subsection by a space of at least 30 feet (9.1 m).

(c) Flammable liquids such as gasoline, kerosene, solvents, and light fuel oils shall not be stored on the premises except when such storage conforms to WAC 296-24-330, and when walls and sills or curbs are provided in accordance with (a) or (b) of this subsection.

(d) LP-Gas shall not be stored on the premises except when such storage conforms to WAC 296-24-475.

(e) Sulfur and finely divided metals shall not be stored in the same building with ammonium nitrate except when such storage conforms to chapter 296-52 WAC and NFPA Std. 495, Explosive Materials Code.

(f) Explosives and blasting agents shall not be stored in the same building with ammonium nitrate except on the premises of makers, distributors, and user-compounders of explosives or blasting agents.

(g) Where explosives or blasting agents are stored in separate buildings, other than on the premises of makers, distributors, and user-compounders of explosives or blasting agents, they shall be separated from the ammonium nitrate by the distances and/or barricades specified in Table H-22 of WAC 296-52-481, but by not less than 50 feet (15.2 m).

(h) Storage and/or operations on the premises of makers, distributors, and user-compounders of explosives or blasting agents shall be in conformity with chapter 296-52 WAC.

(6) General precautions.

(a) Electrical installations shall conform to the requirements of chapter 296-24 WAC, Part L, for ordinary locations. They shall be designed to minimize damage from corrosion.

(b) In areas where lightning storms are prevalent, lightning protection shall be provided. (See the Lightning Protection Code, NFPA 78-1992.)

(c) Provisions shall be made to prevent unauthorized personnel from entering the ammonium nitrate storage area.

(7) Fire protection.

(a) Not more than 2,500 (2270 metric) tons of bagged ammonium nitrate shall be stored in a building or structure not equipped with an automatic sprinkler system. Sprinkler systems shall be of the approved type and installed in accordance with WAC 296-24-607.

(b) Suitable fire control devices such as small hose or portable fire extinguishers shall be provided throughout the warehouse and in the loading and unloading areas. Suitable fire control devices shall comply with the requirements of WAC 296-24-592 and 296-24-602.

(c) Water supplies and fire hydrants shall be available in accordance with recognized good practices.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-465, filed 3/6/95, effective 4/20/95; 91-03-044 (Order 90-18), § 296-52-465, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-465, filed 5/6/86.]

WAC 296-52-469 Storage of blasting agents and supplies. (1) Blasting agents or ammonium nitrate, when stored in conjunction with explosives, shall be stored in the

manner set forth in WAC 296-52-453 (2)(a) for explosives. The mass of blasting agents and one-half the mass of ammonium nitrate shall be included when computing the total quality of explosives for determining distance requirements.

(2) Blasting agents, when stored entirely separate from explosives, may be stored in the manner set forth in WAC 296-52-453 (5) and (6) or in one-story warehouses (without basements) which shall be:

(a) Noncombustible or fire resistive;

(b) Constructed so as to eliminate open floor drains and piping into which molten materials could flow and be confined in case of fire;

(c) Weather resistant;

(d) Well ventilated; and

(e) Equipped with a strong door kept securely locked except when open for business.

(3) Semitrailer or full-trailer vans used for highway or on-site transportation of the blasting agents are satisfactory for temporarily storing these materials, provided they are located in accordance with Table H-21 with respect to inhabited buildings, passenger railways, and public highways and according to Table H-22 with respect to one another. Trailers shall be provided with substantial means for locking, and the trailer doors shall be kept locked, except during the time of placement and removal of stocks of blasting agents.

(4) Warehouses used for the storage of blasting agents shall be located in accordance with the provisions of Table H-21 with respect to inhabited buildings, passenger railways, and public highways, and according to Table H-22 with respect to one another.

(5) If both blasting agents and ammonium nitrate are handled or stored within the distance limitations prescribed in Table H-21, one-half the mass of the ammonium nitrate shall be added to the mass of the blasting agent when computing the total quality of explosives for determining the proper distance.

(6) Smoking, matches, open flames, spark producing devices, and firearms are prohibited inside of or within 50 feet (15.2 m) of any warehouse used for the storage of blasting agents. Combustible materials shall not be stored within 50 feet (15.2 m) of warehouses used for the storage of blasting agents.

(7) The interior of warehouses used for the storage of blasting agents shall be kept clean and free from debris and empty containers. Spilled materials shall be cleaned up promptly and safely removed. Combustible materials, flammable liquids, corrosive acids, chlorates, or nitrates shall not be stored in any warehouse used for blasting agents unless separated therefrom by a fire resistive separation of not less than one hour resistance. The provisions of this subsection shall not prohibit the storage of blasting agents together with nonexplosive blasting supplies.

(8) Piles of ammonium nitrate and warehouses containing ammonium nitrate shall be adequately separated from readily combustible fuels.

(9) Caked oxidizers, either in bags or in bulk, shall not be loosened by blasting.

(10) Every warehouse used for the storage of blasting agents shall be under the supervision of a competent person who shall be not less than twenty-one years of age.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-469, filed 3/6/95, effective 4/20/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-469, filed 5/6/86.]

WAC 296-52-477 Quantity and distance table for separation between magazines. Magazines containing blasting caps and electric blasting caps shall be separated from other magazines containing like contents, or from magazines containing explosives by distances in the following table.

TABLE H-21
QUANTITY AND DISTANCE TABLE FOR SEPARATION BETWEEN
MAGAZINES CONTAINING EXPLOSIVES

Pounds Over	Pounds Not Over	Separation Distance in Feet Between Magazines	
		Not Barricaded	Barricaded
2	5	12	6
5	10	16	8
10	20	20	10
20	30	22	11
30	40	24	12
40	50	28	14
50	75	30	15
75	100	32	16
100	125	36	18
125	150	38	19
150	200	42	21
200	250	46	23
250	300	48	24
300	400	54	27
400	500	58	29
500	600	62	31
600	700	64	32
700	800	66	33
800	900	70	35
900	1,000	72	36
1,000	1,200	78	39
1,200	1,400	82	41
1,400	1,600	86	43
1,600	1,800	88	44
1,800	2,000	90	45
2,000	2,500	98	49
2,500	3,000	104	52
3,000	4,000	116	58
4,000	5,000	122	61
5,000	6,000	130	65
6,000	7,000	136	68
7,000	8,000	144	72
8,000	9,000	150	75
9,000	10,000	156	78
10,000	12,000	164	82
12,000	14,000	174	87
14,000	16,000	180	90
16,000	18,000	188	94
18,000	20,000	196	98
20,000	25,000	210	105
25,000	30,000	224	112
30,000	35,000	238	119
35,000	40,000	248	124
40,000	45,000	258	129
45,000	50,000	270	135
50,000	55,000	280	140
55,000	60,000	290	145
60,000	65,000	300	150
65,000	70,000	310	155
70,000	75,000	320	160
75,000	80,000	330	165
80,000	85,000	340	170

85,000	90,000	350	175
90,000	95,000	360	180
95,000	100,000	370	185
100,000	110,000	380	195
110,000	120,000	410	205
120,000	130,000	430	215
130,000	140,000	450	225
140,000	150,000	470	235
150,000	160,000	490	245
160,000	170,000	510	255
170,000	180,000	530	265
180,000	190,000	550	275
190,000	200,000	570	285
200,000	210,000	590	295
210,000	230,000	630	315
230,000	250,000	670	335
250,000	275,000	720	360
275,000	300,000	770	385

Note 1. The term "natural barricade" is defined in WAC 296-52-417.

Note 2. Efficient artificial barricade is defined in WAC 296-52-417.

Note 3. "Barricaded" means that a building containing explosives is effectually screened from a magazine, building, railway, or highway, either by a natural barricade, or by an artificial barricade of such height that a straight line from the top of any sidewall of the building containing explosives to the eave line of any magazine, or building, or to a point 12 feet above the center of a railway or highway, will pass through such intervening natural or artificial barricade.

Note 4. This table applies only to the manufacture and permanent storage of commercial explosives. It is not applicable to transportation of explosives, or any handling or temporary storage necessary or incident thereto. It is not intended to apply to bombs, projectiles, or other heavily encased explosives.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-477, filed 3/6/95, effective 4/20/95; 90-03-029 (Order 89-20), § 296-52-477, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-477, filed 5/6/86.]

WAC 296-52-481 Recommended separation distances of ammonium nitrate and blasting agents from explosives or blasting agents.

TABLE H-22
TABLE OF RECOMMENDED SEPARATION DISTANCES OF AM-
MONIUM NITRATE AND BLASTING AGENTS FROM EXPLOSIVES
OR BLASTING AGENTS^{1 6}

TABLE H-22

Donor weight		Minimum separation distance of receptor when barricaded ² (ft.)		Minimum thickness of arti- ficial barri- cades ⁵ (in.)
Pounds over	Pounds not over	Ammonium nitrate ³	Blasting agent ⁴	
	100	3	11	12
100	300	4	14	12
300	600	5	18	12
600	1,000	6	22	12
1,000	1,600	7	25	12
1,600	2,000	8	29	12
2,000	3,000	9	32	15
3,000	4,000	10	36	15
4,000	6,000	11	40	15
6,000	8,000	12	43	20
8,000	10,000	13	47	20
10,000	12,000	14	50	20
12,000	16,000	15	54	25
16,000	20,000	16	58	25

20,000	25,000	18	65	25
25,000	30,000	19	68	30
30,000	35,000	20	72	30
35,000	40,000	21	76	30
40,000	45,000	22	79	35
45,000	50,000	23	83	35
50,000	55,000	24	86	35
55,000	60,000	25	90	35
60,000	70,000	26	94	40
70,000	80,000	28	101	40
80,000	90,000	30	108	40
90,000	100,000	32	115	40
100,000	120,000	34	122	50
120,000	140,000	37	133	50
140,000	160,000	40	144	50
160,000	180,000	44	158	50
180,000	200,000	48	173	50
200,000	220,000	52	187	60
220,000	250,000	56	202	60
250,000	275,000	60	216	60
275,000	300,000	64	230	60

Notes to table of recommended separation distances of ammonium nitrate and blasting agents from explosives or blasting agents:

- Note 1. These distances apply to the separation of stores only. Table H-20 shall be used in determining separation distances from inhabited buildings, passenger railways, and public highways.
- Note 2. When the ammonium nitrate and/or blasting agent is not barricaded, the distances shown in the table shall be multiplied by six. These distances allow for the possibility of high velocity metal fragments from mixers, hoppers, truck bodies, sheet metal structures, metal containers, and the like which may enclose the "donor." Where storage is in bullet-resistant magazines recommended for explosives or where the storage is protected by a bullet-resistant wall, distances, and barricade thicknesses in excess of those prescribed in Table H-20 are not required.
- Note 3. The distances in the table apply to ammonium nitrate that passes the insensitivity test prescribed in the definition of ammonium nitrate fertilizer promulgated by the Fertilizer Institute*; and ammonium nitrate failing to pass said test shall be stored at separation distances determined by competent persons. (*Definition and Test Procedures for Ammonium Nitrate Fertilizer, The Fertilizer Institute, formerly the National Plant Food Institute, November 1964.)
- Note 4. These distances apply to nitro-carbo-nitrates and blasting agents which pass the insensitivity test prescribed in the United States Department of Transportation (DOT) regulations.
- Note 5. Acceptable barricades include either natural or artificial barricades as defined in WAC 296-52-417.
- Note 6. When the ammonium nitrate must be counted in determining the distances to be maintained from inhabited buildings, passenger railways and public highways, it may be counted at one-half its actual weight because its blast effect is lower.
- Note 7. Guide to use of table of recommended separation distances of ammonium nitrate and blasting agents from explosives or blasting agents.
- Sketch location of all potential donor and acceptor materials together with the maximum mass of material to be allowed in that vicinity. (Potential donors are high explosives, blasting agents, and combination of masses of detonating materials. Potential acceptors are high explosives, blasting agents, and ammonium nitrate.)
 - Consider separately each donor mass in combination with each acceptor mass. If the masses are closer than table allowance (distances measured between nearest edges), the combination of masses becomes a new potential donor of weight equal to the total mass. When individual masses are considered as donors, distances to potential acceptors shall be measured between edges. When combined masses within propagating distance of each other are considered as a donor, the appropriate distance to

the edge of potential acceptors shall be computed as a weighted distance from the combined masses:

- (i) Calculation of weighted distance from combined masses:

Let $M_2, M_3 \dots M_n$ be donor masses to be combined.

M_1 is a potential acceptor mass.

D_{12} is distance from M_1 to M_2 (edge to edge).

D_{13} is distance from M_1 to M_3 (edge to edge), etc.

To find weighted distance $[D_{1(2,3 \dots n)}]$ from combined masses to M_1 , add the products of the individual masses and distances and divide the total by the sum of the masses thus:

$$D_{1(2,3 \dots n)} = \frac{M_2 \times D_{12} + M_3 \times D_{13} + \dots + M_n \times D_{1n}}{M_2 + M_3 + \dots + M_n}$$

Propagation is possible if either an individual donor mass is less than the tabulated distance from an acceptor or a combined mass is less than the weighted distance from an acceptor.

- In determining the distances separating highways, railroads, and inhabited buildings from potential explosions (as prescribed in Table H-20), the sum of all masses which may propagate (i.e., lie at distances less than prescribed in the Table) from either individual or combined donor masses are included. However, when the ammonium nitrate must be included, only 50 percent of its weight shall be used because of its reduced blast effects. In applying Table H-21 to distances from highways, railroads, and inhabited buildings, distances are measured from the nearest edge of potentially explodable material.
- When all or part of a potential acceptor comprises Explosives Class A as defined in DOT regulations, storage in bullet-resistant magazines is required. Safe distances to stores in bullet-resistant magazines may be obtained from the intermagazine distances prescribed in Table H-21.
- Barricades must not have line-of-sight openings between potential donors and acceptors which permit blast or missiles to move directly between masses.
- Good housekeeping practices shall be maintained around any bin containing ammonium nitrate or blasting agent. This includes keeping weeds and other combustible materials cleared within 25 feet of such bin. Accumulation of spilled product on the ground shall be prevented.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-481, filed 3/6/95, effective 4/20/95; 90-03-029 (Order 89-20), § 296-52-481, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-481, filed 5/6/86.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 296-52-487 Low explosives. (1) Magazines which are restricted to the storage of only Class C (low explosives) as defined in this chapter, or classified as low explosives by the Bureau of Alcohol, Tobacco and Firearms, may be located in accordance with Table H-24.

(2) Detonators shall not be stored with any other low explosives.

TABLE H-24
TABLE OF DISTANCES FOR STORAGE OF LOW
EXPLOSIVES

Pounds		From inhabited building distance	From public railroad and highway	From above ground magazine
Over	Not Over	(feet)	distance (feet)	(feet)
0	1,000	75	75	50
1,000	5,000	115	115	75
5,000	10,000	150	150	100
10,000	20,000	190	190	125
20,000	30,000	215	215	145
30,000	40,000	235	235	155
40,000	50,000	250	250	165
50,000	60,000	260	260	175
60,000	70,000	270	270	185
70,000	80,000	280	280	190
80,000	90,000	295	295	195
90,000	100,000	300	300	200
100,000	200,000	375	375	250
200,000	300,000	450	450	300

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-487, filed 3/6/95, effective 4/20/95; 88-23-054 (Order 88-25), § 296-52-487, filed 11/14/88.]

WAC 296-52-489 Transportation. (1) Regulations governing the transportation of explosives on public highways are adopted by the United States Department of Transportation (see 49 CFR Parts 100 through 199) and the Washington Utilities and transportation commission and administered by the Washington state patrol.

(2) The regulations of this section shall be applicable in-and-on job sites and off-highway roads. The department of labor and industries shall administer these regulations in locations such as but not limited to: Construction or mining access roads and blast sites; off-highway forest roads including both publicly and privately owned logging roads, haul roads or general access roads.

Note: Examples of publicly owned off-highway roads where these regulations are applicable shall include, but are not limited to: U.S. Forest Service roads, Bureau of Land Management roads, state department of natural resources roads, but specifically not including the state or interstate highway system.

(a) No person shall be allowed to smoke, carry matches or any other flame-producing device, except guards or commissioned law enforcement officers, to carry any firearms or loaded cartridges while in or near a motor vehicle transporting explosives; or drive, load, or unload such vehicle in a careless or reckless manner.

(b) Explosives shall not be carried on any vehicle while vehicle is being used to transport workers other than driver and two persons.

(c) Explosives shall be transferred from a disabled vehicle to another, only when proper and qualified supervision is provided. Local fire and police departments shall be promptly notified in congested areas. In remote areas they shall be notified if appropriate.

(d) Other materials or supplies shall not be placed on or in the cargo space of a conveyance containing explosives,

detonating cord or detonators, except carrying safety fuse, and properly secured, nonsparking equipment used expressly in the handling of such explosives will be permissible.

(3) Transportation vehicles.

(a) All vehicles used for transporting explosives shall be strong enough to carry the load without difficulty and be in good mechanical condition. The cargo compartment(s) shall have a tight floor and must not have any exposed spark producing metal on the inside which could come into contact with explosives cargo.

(b) Explosives vehicles used on any roadway which is open to public travel shall comply with WAC 296-52-550, Appendix II.

(c) Open top explosives transportation vehicles may only be used on the jobsite or on roads which are not open to public travel (while laden with explosives). In open top vehicles or trailers, explosives may only be transported in the original DOT approved shipping container(s)/box(es) or a daybox or portable magazine which complies with the requirements of this chapter. In all instances the explosive container(s), box(es), daybox or portable magazine shall be secured to the bed of the vehicle or trailer.

(i) If an explosives transportation vehicle or trailer does not have a fully enclosed cargo area with nonsparking interior, the cargo bed and all explosive cargo shall be covered with a flameproof and moisture-proof tarpaulin or other effective protection against moisture and sparks. Whenever tarpaulins are used for covering explosives, both the tarpaulin and the explosives container shall be secured to the body of the truck bed by means of rope, wire, or other equally efficient tie downs.

(ii) Packages of explosives shall not be loaded above the sides on open-sided vehicles.

(4) Vehicles shall be placarded and displayed as specified by the United States Department of Transportation, CFR 49-1981, Parts 100 through 199. Placards shall remain on the vehicle until all explosives have been removed from the vehicle.

(5)(a) Each motor vehicle used for transporting explosives shall be equipped with a minimum of two extinguishers, each having a rating of at least 2A 10BC. The driver shall be trained in the use of the extinguishers on the vehicle.

(i) Only extinguishers listed or approved by a nationally recognized testing laboratory shall be deemed suitable for use on explosives-carrying vehicles. Refer to WAC 296-24-58501(19) for definition of listed, and federal regulation 29 CFR 1910.7 for nationally recognized testing laboratory.

(ii) Extinguishers shall be filled and ready for immediate use and readily available. Extinguishers shall be examined periodically by a competent person.

(b) A motor vehicle used for transporting explosives shall be given the following inspection to determine that it is in proper condition for safe transportation of explosives:

(i) Fire extinguishers shall be filled and in working order.

(ii) All electrical wiring shall be completely protected and securely fastened to prevent short-circuiting.

(iii) Chassis, motor, pan, and underside of body shall be reasonably clean and free of excess oil and grease.

(iv) Fuel tank and feedline shall be secure and have no leaks.

(v) Brakes, lights, horn, windshield wipers, and steering apparatus shall function properly.

(vi) Tires shall be checked for proper inflation and defects.

(vii) The vehicle shall be in proper condition in every other respect and acceptable for handling explosives.

(c) Motor vehicles or conveyances carrying explosives, blasting agents, or blasting supplies, shall not be taken inside a garage or shop for repairs or servicing.

(6) Operation of transportation vehicles.

(a) Vehicles transporting explosives shall only be driven by and be in the charge of a licensed driver who is not less than twenty-one years of age, physically fit, careful, capable, reliable, able to read and write the English language, and not addicted to the use, or under the influence of intoxicants, narcotics, or other dangerous drugs. This rule does not apply to persons taking prescription drugs and/or narcotics as directed by a physician providing such use shall not endanger the worker or others. They shall be familiar with the traffic regulations, state laws, and the provisions of this section.

(i) Explosives may only be transported by a licensed manufacturer, blaster, purchaser or seller, or the designated agent or representative thereof, or a contract carrier for hire who complies with all requirements for transportation of hazardous materials.

(ii) The person in control of the explosive laden vehicle shall be made aware of the nature of the cargo and pertinent safety precautions relating to the particular explosive(s) being transported.

(b) Parking. A motor vehicle which contains Class A or Class B explosives must not be parked under any of the following circumstances:

(i) On or within 5 feet of the traveled portion of a public street or highway;

(ii) On private property (including premises of a fueling or eating facility) without the knowledge and consent of the person who is in charge of the property and who is aware of the nature of the hazardous materials the vehicle contains; or

(iii) Within 300 feet of a bridge, tunnel, dwelling, building, or place where people work, congregate, or assemble, except for brief periods when the necessities of operation require the vehicle to be parked and make it impracticable to park the vehicle in any other place.

(c) Every motor vehicle transporting any quantity of Class A or Class B explosives shall, at all times, be attended by a driver or other attendant of the motor carrier. This attendant shall have been made aware of the class of the explosive material in the vehicle and of its inherent dangers, and shall have been instructed in the measures and procedures to be followed in order to protect the public from those dangers. The attendant shall have been made familiar with the vehicle to which assigned, and shall be trained, supplied with the necessary means, and authorized to move the vehicle when required.

(i) For the purpose of this subdivision, a motor vehicle shall be deemed "attended" only when the driver or other attendant is physically on or in the vehicle, or has the vehicle within the driver or attendants field of vision and can reach it quickly and without any kind of interference;

"attended" also means that the driver or attendant is awake, alert, and not engaged in other duties or activities which may divert their attention from the vehicle.

(ii) An explosive laden vehicle may be left unattended for a period not to exceed 48 hours provided that:

(A) The vehicle is parked in a designated parking lot which complies with NFPA Std. 498 and with the appropriate clearance table of this chapter for the type and quantity of explosives carried;

(B) The designated parking lot is correctly bermed and walled or fenced and gated to prevent unauthorized entry;

(C) The designated lot is inspected and approved by the department of labor and industries and is provided with a full-time security patrol at all times when explosives are present;

(D) Trucks used for explosives delivery which contain only blasting agents (International Class 1.5 D) and no high explosives need not be attended provided the vehicle is locked to prevent movement of the vehicle, the cargo compartments are locked to prevent theft, the vehicle is parked according to all applicable storage distance requirements, and the vehicle is located in a secured area which restricts entry to the area by unauthorized personnel.

(d) No spark-producing metal, spark-producing tools, oils, matches, firearms, electric storage batteries, flammable substances, acids, oxidizing materials, or corrosive compounds shall be carried in the body of any motor truck and/or vehicle transporting explosives, unless the loading of such dangerous articles and the explosives comply with U.S. Department of Transportation regulations.

(e) Vehicles transporting explosives shall avoid congested areas and heavy traffic.

(f) Delivery and issue of explosives shall only be made by and to authorized persons and into authorized magazines or authorized temporary storage or handling area.

(7) Transporting blasting caps and explosives in the same vehicle.

(a) Fuse type blasting caps, blasting caps with safety fuse and/or blasting caps with metal clad mild detonating fuse shall not be transported in the same vehicle or trailer with other explosives.

(b) Blasting caps rated by U.S. DOT as nonmass detonating may be transported in the same vehicle or trailer with other explosives when:

(i) The caps are carried in DOT approved shipping containers;

(ii) The truck or trailer complies with Appendix 1, WAC 296-52-550.

(8) When primers are made up at a central primer house for use in high speed tunneling, the following shall apply:

(a) Only enough primers shall be made up for each round of blasting.

(b) The primers shall be placed in separate containers or bins, categorized by degree of delay in such a manner so as to prevent them from physical impact.

(c) Explosives carried in the same magazine shall be separated by 1/4-inch steel, covered on each side by four inches of hardwood planking, or equivalent.

(d) Hoist operators shall be notified before explosives or blasting agents are transported in a shaft conveyance.

(e) Only a state approved powder car or conveyance shall be used underground.

(f) The number of primers for one round will be removed from the state approved car or vehicle at the face or heading after the drilling has been completed and the holes readied for loading. After loading the charge, the powder car or vehicle will be withdrawn from the tunnel.

(g) Wires on electric caps shall be kept shunted until wired to the bus wires.

(h) The powder car or conveyance shall be inspected daily for lights, brakes and external damage to electrical circuitry. The electrical system shall be checked weekly to detect any failures that may constitute an electrical hazard and a written certification record of such inspection shall be kept on file for the duration of the job. The certification record shall contain the date of inspection, the serial number or other positive identification of the unit being inspected and the signature of the person performing the inspection.

(i) The installation of auxiliary lights on truck beds, which are powered by the truck's electrical system, shall be prohibited.

(j) No one, except the operator, the helper, and/or the powderperson, shall be permitted to ride on a conveyance transporting explosives and blasting agents.

(k) No person shall ride in any shaft conveyance transporting explosives and blasting agents.

(l) No explosives or blasting agents shall be transported on a crew-haul trip.

(m) The car or conveyance containing explosives or blasting agents shall be pulled, not pushed, whenever possible.

(n) The powder car or conveyance especially built for the purpose of transporting explosives or blasting agents shall bear a reflectorized sign on each side with the word "explosives" in letters not less than 4 inches in height; upon a background of sharply contrasting color.

(o) Compartments for transporting detonators and explosives in the same car or conveyance shall be physically separated by a distance of 24 inches or by a solid partition at least 6 inches thick.

(p) Detonators and other explosives shall not be transported at the same time in any shaft conveyance.

(q) Explosives and/or blasting agents, not in original containers, shall be placed in a suitable container when transported manually.

(r) No explosives or blasting agents shall be transported on any locomotive. At least two car lengths shall separate the locomotive from the powder car.

(9) When explosives are carried to the blasting site from the main storage magazines by the blaster or helper:

(a) Special insulated containers or original DOT shipping containers shall be used for this purpose, either boxes or bags, one container for explosives and one for detonators.

(b) Detonators or explosives shall never be carried in pockets of clothing.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-489, filed 3/6/95, effective 4/20/95; 92-17-022 (Order 92-06), § 296-52-489, filed 8/10/92, effective 9/10/92; 91-03-044 (Order 90-18), § 296-52-489, filed 1/10/91, effective 2/12/91; 88-23-054 (Order 88-25), § 296-52-489, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-489, filed 5/6/86.]

WAC 296-52-493 Use of explosives and blasting agents. (1) General provisions.

(a) While explosives are being handled or used, smoking, matches, or any other source of fire or flame shall not be allowed within 100 feet of the blast site. No person shall be allowed to handle explosives while under the influence of intoxicating liquors, narcotics, or other dangerous drugs. This rule does not apply to persons taking prescription drugs and/or narcotics as directed by a physician providing such use shall not endanger the worker or others.

(b) Original containers or day box magazines shall be used for taking detonators and other explosives from storage magazines to the blast site.

(c) When blasting is done in congested areas or in close proximity to a structure, railway, or highway or any other installation that may be damaged, the blast shall be covered before firing with a mat or other suitable protective material that is capable of preventing fragments from being thrown.

(d) Persons authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution, including but not limited to warning signals, flags and barricades or blasting mats to insure the safety of the general public and workers.

(e) Blasting operations shall be conducted during daylight hours whenever possible.

(f) Whenever blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph, and steam utilities, the user (blaster) shall notify the appropriate representatives of such utilities at least twenty-four hours in advance of blasting, specifying the location and intended time of such blasting. Verbal notice shall be confirmed with written notice. The blaster shall ensure that appropriate measures for safe control have been taken.

(g) Due precaution shall be taken to prevent unintended discharge of blasting caps from extraneous electric current or from transmitted radio frequency (RF) energy. Examples:

Common sources of extraneous electricity include but are not limited to adjacent powerlines, dust storms and lightning storms.

Common sources of hazardous RF transmissions include but are not limited to: (MOBILE) citizen band (CB) or side band radio transmitters, VHF (FM) radio transmitters, UHF cellular telephones and radar transmitters. (FIXED LOCATION TRANSMITTERS) base stations for CB, side band or FM radio communications, UHF cellular telephone transmitters and service extension repeater systems, AM and FM (commercial) radio broadcast transmitters, TV broadcast transmitters and repeater system transmitters, surface scan and radio navigation beacons.

(h) Low flying aircraft and in particular military aircraft create the most common serious RF exposures. These highly unpredictable mobile transmitters are very powerful and transmit on a broad spectrum of frequencies including radar, laser and all common communications bands. Probably the two most dangerous examples are low flying automatic terrain following guidance systems and airplanes which are equipped to jam all common radar and communications frequencies for a distance of several miles around the airborne transmitters.

(i) Precautions to prevent unintended discharge of electric blasting caps from extraneous electric currents or RF transmission shall include:

(i) Positive identification of voltages in electrical transmission and distribution lines and specific required clearance for each specific system; and

(ii) Complete suspension of all blasting operations and removal of all personnel from the blast site during the approach and progress of heavy dust storms which may create static lightening or conventional thunder and lightening storms; and

(iii) The posting of signs warning against the use of radio frequency transmitters including CBs, mobile phones and two-way radios. The required signs shall be placed in a manner to adequately warn transmitter users, including all routes into the required clearance zone around where electric blasting caps are used.

(A) The required clearance zone for construction and/or demolition operations shall be 1000 feet;

(B) The required clearance zone for general industry operations which are not subject to construction requirements shall be 350 feet.

Note: See Appendix II, WAC 296-52-552 for illustrations and specific posting requirements.

(iv) Ensuring that mobile RF transmitters which are less than 100 feet away from electrical blasting caps are deenergized or disconnected when the caps are not fully contained in the original DOT shipping containers; and

(v) Fixed location RF transmitters represent a higher level of hazard to both storage and/or blasting operations involving electric caps because the transmitters are more powerful and transmit dangerous levels of RF exposure over much greater distances. Storage or blasting operations with electric caps shall only be carried out in full compliance with the appropriate recommended distance tables published in *INSTITUTE OF MAKERS OF EXPLOSIVES (I.M.E.) Publication No. 20, 1988, "SAFETY GUIDE FOR THE PREVENTION OF RADIO FREQUENCY HAZARDS IN THE USE OF COMMERCIAL ELECTRIC DETONATORS (Blasting Caps)";* and

(vi) When necessary to conduct blasting operations within the required separation distances specified in I.M.E. Pamphlet 20-1988, the storage and use of electric blasting caps shall be prohibited on the site and only detonating cord, safety fuse, shock tube or other approved nonelectric systems may be used.

(j) No fire shall be fought where the fire is in imminent danger of contact with explosives. All employees shall be removed to a safe area and the fire area guarded against intruders.

(k) Electric detonators shall be shunted until wired into the blasting circuit.

(l) Explosives shall not be handled near open flames, uncontrolled sparks or energized electric circuits.

(m) Delivery and issue of explosives shall only be made by and to authorized persons and into authorized magazines or approved temporary storage or handling area.

(n) Blaster in charge.

(i) The blast site shall be under the control of a fully qualified and currently licensed "blaster in charge" throughout the course of every blasting operation. That obligation

shall commence with a site survey to determine potential safety conflicts with: Public utility transmission systems, dwellings or other occupied buildings, roads or railroads, radio frequency transmitters, preexisting explosives storage magazines.

(ii) Whenever the site survey identifies conditions which conflict with safe blasting operations, the blaster in charge shall prepare a written site blasting plan before beginning blasting operations. The written plan shall identify the methods, materials, procedures and/or engineering calculations which will be used to address each identified conflicting condition.

Note 1. When the site survey identifies that no conflicting conditions exist, a written blasting plan is not required.

Note 2. Written blasting plans may be discarded at the end of a job provided that no blasting incident has occurred which resulted in bodily injury or property damage.

(iii) All on-site transportation, storage, loading and firing of explosives shall be supervised by the blaster in charge. Trainees and inexperienced personnel shall work only under direct supervision of licensed personnel fully qualified in the blasting method in use, including safety procedures and blasting signals in use at that site.

(iv) The site blasting plan shall include designated safe location(s) for personnel during actual blasting and a method for determining when all personnel are accounted for in the designated safe location(s).

Note: It is desirable that all potential means of egress into the blast site should be under observation immediately prior to each blast. The observer(s) should be provided with a means of communication with the blaster in charge.

(o) The employer shall permit only competent and authorized personnel to handle explosives.

(p) No explosive shall be loaded or used underground in the presence of combustible gases or combustible dusts unless approved as permissible by MSHA.

(q) In either electric or nonelectric blasting, the firing line(s) shall not be connected to the blast initiating device until all personnel have been accounted for and removed from the blast danger area or are in a blast shelter or other location which affords adequate protection.

(2) Storage at use sites.

(a) Empty boxes and paper and fiber packing materials which have previously contained high explosives shall not be used again for any purpose, but shall be destroyed by burning at the blast site or at an approved isolated location out of doors, and no person shall be nearer than 100 feet after the burning has started.

(b) When opening kegs or wooden cases, no sparking metal tools shall be used; wooden wedges and either wood, fiber or rubber mallets shall be used. Nonsparking metallic slitters may be used for opening fiberboard cases.

(c) Should cartridges or packages of explosives show signs of deterioration, the manufacturer or the department shall be notified. Such explosives must be carefully set aside and properly disposed of.

(3) Loading of explosives or blasting agents in blast holes.

(a) Procedures that permit safe and efficient loading shall be established before loading is started.

(b) All drill holes shall be sufficiently large to admit freely the insertion of the cartridges of explosives. Holes shall be checked prior to loading to determine depth and conditions.

(c) Tamping shall be done only with wood rods or with approved plastic tamping poles without exposed metal parts, but nonsparking metal connectors may be used for jointed poles. Violent tamping shall be avoided. The primer shall never be tamped.

(d) No holes shall be loaded except those to be fired in the next round of blasting. After loading, all remaining explosives and detonators shall be immediately returned to an authorized magazine or day box.

(e) Drilling shall not be started until all remaining butts of old holes are examined for unexploded charges, and if any are found, they shall be refired before work proceeds.

(f) When a charge of explosives has been exploded in a bore hole to enlarge or "spring" it, an interval of at least two hours must be allowed to pass before an additional charge of explosives can be loaded into the hole.

Note: There may be an exception made to this rule provided the sprung hole is thoroughly wet down with water before it is loaded.

(g) No person shall be allowed to deepen drill holes which have contained explosives or blasting agents.

(h) No explosives or blasting agents shall be left unattended at blast sites unless stored in a licensed magazine.

(i) Users (blasters) shall not load, store or use explosives closer than the length of the steel being used for drilling and in no event nearer than fifty feet of drilling operations.

(j) Machines and all tools not used for loading explosives into bore holes shall be removed from the immediate location of holes being loaded with explosives. Equipment shall not be operated within 50 feet of loaded holes except when equipment is needed to add burden, mats or tracking of drills out of the loading area.

(k) Powerlines and portable electric cables for equipment being used shall be kept a safe distance from explosives or blasting agents being loaded into drill holes. Cables in the proximity of the blast area shall be deenergized and locked out by the blaster.

(l) Holes shall not be drilled where there is danger of intersecting a charged or misfired hole.

(m) All blast holes in open work shall be stemmed to the collar or to a point which will confine the charge.

(n) No explosives for underground operations other than those in Fume Class 1, as set forth by the Institute of Makers of Explosives, shall be used; however, explosives complying with the requirements of Fume Class 2 and Fume Class 3 may be used if adequate ventilation has been provided.

(o) Warning signs, indicating a blast area, shall be maintained at all approaches to the blast area. The warning sign lettering shall not be less than 4 inches in height on a contrasting background. All loaded stumps must be marked for identification on logging sites.

(p) A bore hole shall never be sprung when it is adjacent to or near a hole which has been loaded. Flashlight batteries shall not be used as a power source (blasting machine) for springing holes.

(q) No loaded holes shall be left unattended or unprotected.

(r) The user (blaster) shall keep an accurate, up-to-date record of explosives, blasting agents, and blasting supplies used in a blast and shall keep an accurate running inventory of all explosives and blasting agents stored on the operation.

(s) When loading blasting agents pneumatically over primed boosters, semiconductive delivery hose shall be used and the equipment shall be bonded and grounded.

(4) Initiation of explosive charges - electric blasting.

(a) Blasting cap leg wires shall be kept short-circuited (shunted) until they are connected into the circuit for firing.

(b) Before adopting any system of electrical firing, the user (blaster) shall conduct a thorough survey for extraneous currents, and all dangerous currents shall be eliminated before any holes are loaded.

(c) In any single blast using electric blasting caps, all caps shall be of the same style or function and be of the same manufacture and compatible with each other.

(d) Electric blasting shall be carried out by using blasting circuits or power circuits in accordance with the electric blasting cap manufacturer's recommendations.

(e) The firing line shall be checked with an approved testing device at the terminals before being connected to the blasting machine or other power source.

(f) The circuit including all caps shall be tested with an approved testing device before being connected to the firing line.

(g) When firing a circuit of electric blasting caps, care shall be exercised to ensure that an adequate quantity of delivered current is available, in accordance with the manufacturer's recommendations.

(h) Connecting wires and lead wires shall be insulated single solid wires of sufficient current-carrying capacity, and shall not be less than twenty gauge (American wire gauge) solid core insulated wire.

(i) Firing line or lead wires shall be solid single wires of sufficient current-carrying capacity, and shall be not less than fourteen gauge (American wire gauge) solid core insulated wire. Bus wires - depends on the size of the blast, fourteen gauge (American wire gauge) copper is recommended.

(j) The ends of lead wires which are to be connected to a firing device shall be shorted by twisting them together or otherwise shunting them before they are connected to the leg wires or connecting wires, and they shall be kept in the control of the person who is doing the loading until loading is completed and the leg wires attached. Lead wires shall not be attached to the firing device until the blaster is ready to fire the shot and must be attached by the user (blaster) themselves.

(k) The ends of the leg wires on electric detonators shall be shorted in a similar manner and not separated other than for testing until all holes are loaded and the loader is ready to connect the leg wires to the connecting wires or lead wires.

(l) When firing electrically, the insulation on all firing lines shall be adequate and in good condition.

(m) A power circuit used for firing electric blasting caps shall not be grounded.

(n) In underground operations when firing from a power circuit, a safety switch shall be placed at intervals in the permanent firing line. This switch shall be made so it can be locked only in the "off" position and shall be provided with a short-circuiting arrangement of the firing lines to the cap circuit.

(o) In underground operations there shall be a "lightning" gap of at least 5 feet in the firing system ahead of the main firing switch; that is, between this switch and the source of power. This gap shall be bridged by a flexible jumper cord just before firing the blast.

(p) When firing from a power circuit, the firing switch shall be locked in the open or "off" position at all times, except when firing. It shall be so designed that the firing lines to the cap circuit are automatically short-circuited when the switch is in the "off" position. Keys to this switch shall be entrusted only to the user (blaster).

(q) Blasting machines shall be in good condition and the efficiency of the machine shall be tested periodically to make certain that it can deliver power at its rated capacity.

(r) When firing with blasting machines, the connections shall be made as recommended by the manufacturer of the electric blasting caps used.

(s) The number of electric blasting caps connected to a blasting machine shall not be in excess of its rated capacity. Furthermore, in primary blasting, a series circuit shall contain no more caps than the limits recommended by the manufacturer of the electric blasting caps in use.

(t) The blaster in charge shall be in charge of the blasting machines, and no other person shall connect the lead wires to the machine.

(u) Users (blasters), when testing circuits to charged holes, shall use only blasting testers especially designed for this purpose.

(v) Whenever the possibility exists that a lead line or blasting wire might be thrown over live overhead powerlines, communication lines, utility services, or other services or structures by the force of an explosion, care shall be taken to see that the total length of wires are kept too short to hit the lines, that the wires are securely anchored to the ground and owners or operators are notified. If those requirements can not be satisfied, a nonelectric system shall be used.

(w) In electrical firing, only the person making lead wire connections shall fire the shot. All connections shall be made from the bore hole back to the source of firing current, and the lead wires shall remain shorted and not be connected to the blasting machine or other source of current until the charge is to be fired.

(x) After firing an electric blast from a blasting machine, the leading wires shall be immediately disconnected from the machine and short-circuited.

(y) When electric blasting caps have been used, workers shall not return to misfired holes for at least thirty minutes.

(5) Use of safety fuse.

(a) A fuse that is deteriorated or damaged in any way shall not be used.

(b) The hanging of fuse on nails or other projections which will cause a sharp bend to be formed in the fuse is prohibited.

(c) Before capping safety fuse, a short length shall be cut from the end of the supply reel so as to assure a fresh cut end in each blasting cap.

(d) Only a cap crimper of approved design shall be used for attaching blasting caps to safety fuse. Crimpers shall be kept in good repair and accessible for use.

(e) No unused cap or short capped fuse shall be placed in any hole to be blasted; such unused detonators shall be removed from the working place and disposed of or stored in licensed magazine.

(f) No fuse shall be capped, or primers made up, in any magazine or near any possible source of ignition.

(g) Capping of fuse and making of primers shall only be done in a place selected for this purpose and at least one hundred feet distant from any storage magazine.

(h) Fuse must be cut long enough to reach beyond the collar of the bore hole and in no case less than three feet. When shooting choker holes, not less than three feet of fuse shall be used.

(i) At least two persons shall be present when multiple cap and fuse blasting is done by hand lighting methods.

(j) Not more than 12 fuses shall be lighted by each blaster when hand lighting devices are used. However, when two or more safety fuses in a group are lighted as one by means of igniter cord, or other similar fuse-lighting devices, they may be considered as one fuse.

(k) The so-called "drop fuse" method of dropping or pushing a primer or any explosive with a lighted fuse attached is prohibited.

(l) Cap and fuse shall not be used for firing mudcap charges unless charges are separated sufficiently to prevent one charge from dislodging other shots in the blast.

(m) When blasting with safety fuses, consideration shall be given to the length and burning rate of the fuse. Sufficient time, with a margin of safety, shall always be provided for the blaster to reach a place of safety.

(n) The burning rate of the safety fuse in use at any time shall be measured, posted in conspicuous locations, and brought to the attention of all workers concerned with blasting. No fuse shall be used that burns faster than one foot in forty seconds or slower than one foot in fifty-five seconds.

(o) For use in wet places the joint between the cap and fuse shall be waterproofed with a compound prepared for this purpose.

(p) In making up primers only nonsparking skewers shall be used for punching the hole in the cartridge to insert the capped fuse. No blasting cap shall be inserted in the explosives without first making a hole in the cartridge of proper size or using a standard cap crimper.

(q) Only sufficient primers for one day's use shall be made up at one time. They shall be stored in a box type magazine in which no other explosives are stored.

(r) Any loose cartridges of explosives, detonators, primers and capped fuse unused at the end of the shift shall be returned to their respective magazines and locked up.

(s) Safety fuse and caps shall only be used for conventional blasting where:

(i) Extraneous electricity or radio frequency transmissions make the use of electric cap and wire systems dangerous;

(ii) Overhead electric transmission lines cannot be deenergized and there is danger that blasting wires may be thrown into the overhead lines during a blast;

(iii) For avalanche control hand charges;

(iv) For specialized applications where cap and fuse is more suitable than electric or other nonelectric initiation systems.

(6) Use of detonating cord.

(a) Care shall be taken to select a detonating cord consistent with the type and physical condition of the bore hole and stemming and the type of explosives used.

(b) Detonating cord shall be handled and used with the same respect and care given other explosives.

(c) For quantity and distance purposes detonating fuse up to 60 grains per foot should be calculated as equivalent to 9 lbs. of high explosives per 1,000 feet. Heavier cord loads should be rated proportionately.

(d) Trunk lines in multiple-row blasts shall make one or more complete loops, with crossties between loops at intervals of not over two hundred feet.

(e) All detonating cord knots shall be tight and all connections shall be kept at right angles to the trunk lines.

(f) The line of detonating cord extending out of a bore hole or from a charge shall be cut from the supply spool before loading the remainder of the bore hole or placing additional charges.

(g) Detonating cord shall be handled and used with care to avoid damaging or severing the cord during and after loading and hooking-up.

(h) Detonating cord connections shall be competent and positive in accordance with approved and recommended methods. Knot-type or other cord-to-cord connections shall be made only with detonating cord in which the explosive core is dry.

(i) All detonating cord trunklines and branchlines shall be free of loops, sharp kinks, or angles that direct the cord back toward the oncoming line of detonation.

(j) All detonating cord connections shall be inspected before firing the blast.

(k) When detonating cord millisecond-delay connectors or short-interval-delay electric blasting caps are used with detonating cord, the practice shall conform strictly to the manufacturer's recommendations.

(l) When connecting a blasting cap or an electric blasting cap to detonating cord, the cap shall be taped or otherwise attached securely along the side or the end of the detonating cord, with the end of the cap containing the explosive charge pointed in the direction in which the detonation is to proceed.

(m) Detonators for firing the trunkline shall not be brought to the loading area nor attached to the detonating cord until everything else is in readiness for the blast.

(7) Initiation of explosive charges - nonelectric blasting.

(a) All nonelectric initiation systems and components of these systems shall be used in accordance with their manufacturers recommendations and instructions.

(b) All members of the blasting crew shall be instructed in the safe use of the initiation system and its components. It shall be the duty of the blaster in charge to provide adequate on-the-job training and supervision in the safe use of such systems.

(c) When a nonelectric shock tube initiation system is used, the tubing shall be free of all knots and tight kinks. The shock tube shall be free of cuts or abrasions that could expose the core to moisture.

(d) All blasting operations shall cease during the approach and progress of a thunderstorm, regardless of the type of initiation system used, and all personnel shall withdraw to a place of safety.

(e) When an explosive bulk truck or other vehicle is operated on a blast site, care shall be taken to ensure that the vehicle does not tread on the tubing, connectors, or any surface delay component. If a vehicle operated on a blast site must pass over loaded blastholes, precautions shall be made to consolidate these elements at the collar of the hole to prevent vehicle contact.

(f) Before firing the shot, the blaster in charge shall make a visual inspection to ensure that the initiation system is hooked up in accordance with the manufacturers recommendations.

(8) Firing the blast.

(a) A code of blasting signals equivalent to Table T-1 shall be posted on one or more conspicuous places at the operation, and all employees shall be required to familiarize themselves with the code and conform to it. Warning signs shall be placed at suitable locations.

(b) All charges shall be covered with blasting mats or other protective material before firing, where blasting may cause injury or damage by flying rock or debris.

(c) Before a blast is fired, a loud warning signal shall be given by the blaster in charge, who has made certain that all surplus explosives are in a safe place and all employees, vehicles, and equipment are at a safe distance, or under sufficient cover.

(d) Flaggers shall be safely stationed on highways which pass through the danger zone so as to stop traffic during blasting operations.

(e) It shall be the duty of the blaster to fix the time of blasting. The blaster shall conduct all blasting operations and no shot shall be fired without the blasters' approval.

(f) Before firing an underground blast, warning shall be given, and all possible entries into the blasting area, and any entrances to any working place where a drift, raise, or other opening is about to hole through, shall be carefully guarded. The blaster shall make sure that all employees are out of the blast area before firing a blast.

TABLE T-1

WARNING SIGNAL	— A 1-minute series of long blasts 5 minutes prior to blast signal.
BLAST SIGNAL	— A series of short blasts 1 minute prior to the shot.
ALL CLEAR SIGNAL	— A prolonged blast following the inspection of blast area.

(9) Inspection after blasting.

(a) Immediately after the blast has been fired, the firing line shall be disconnected from the blasting machine, or where power switches are used, they shall be locked open or in the off position.

(b) Sufficient time shall be allowed, not less than fifteen minutes in tunnels, for the smoke and fumes to leave the blasted area before returning to the shot. An inspection of the area and the surrounding rubble shall be made by the

user (blaster) to determine if all charges have been exploded before employees are allowed to return to the operation, and in tunnels, after the muck pile has been wetted down.

(10) Misfires.

(a) If a misfire is found, the user (blaster) shall provide proper safeguards for excluding all employees or other personnel from the danger zone.

(b) No other work shall be done except that necessary to remove the hazard of the misfire and only those employees necessary to do the work shall remain in the danger zone.

(c) No attempt shall be made to extract explosives from any charged or misfired hole; a new primer shall be put in and the hole reblasted. If refiring of the misfired hole presents a hazard, the explosives may be removed by washing out with water or, where the misfire is under water, blown out with air.

(d) If there are any misfires while using cap and fuse, all employees shall remain away from the charge for at least one hour. Misfires shall be handled under the direction of the person in charge of the blasting.

(e) When electric blasting caps have been used, workers shall not return to misfired holes for at least thirty minutes. All wires shall be carefully traced and a search made for unexploded charges.

(f) If explosives are suspected of burning in a hole, all persons in the endangered area shall move to a safe location and no one shall return to the hole until the danger has passed, but in no case within one hour.

(g) No drilling, digging, or picking shall be permitted until all missed holes have been detonated or the authorized representative has approved that work can proceed.

(11) Underwater blasting.

(a) A user (blaster) shall conduct all blasting operations, and no shot shall be fired without the blasters' approval.

(b) Loading tubes and casings of dissimilar metals shall not be used because of possible electric transient currents from galvanic action of the metals and water.

(c) Only water-resistant initiation systems shall be used for underwater blasting. Loading shall be done through a nonsparking loading tube when tube is necessary.

(d) No blast shall be fired while any vessel under way is closer than 1,500 feet to the blasting area. Those on board vessels or craft moored or anchored within 1,500 feet shall be notified before a blast is fired.

(e) No blast shall be fired while any swimming or diving operations are in progress in the vicinity of the blasting area. If such operations are in progress, signals and arrangements shall be agreed upon to assure that no blast shall be fired while any persons are in the water.

(f) Blasting flags shall be displayed.

(g) The storage and handling of explosives aboard vessels used in underwater blasting operations shall be according to provisions outlined herein on handling and storing explosives.

(h) When more than one charge is placed under water, a float device shall be attached to an element of each charge in such manner that it will be released by the firing. Misfires shall be handled in accordance with the requirements of WAC 296-52-493(10).

(12) Blasting in excavation work in pressurized air locks.

(a) Detonators and explosives shall not be stored or kept in tunnels, shafts, or caissons. Detonators and explosives for each round shall be taken directly from the magazines to the blasting zone and immediately loaded. Detonators and explosives left over after loading a round shall be removed from the working chamber before the connecting wires are connected up. Explosives in transit shall not be left unattended.

(b) When detonators or explosives are brought into an air lock, no employee except the powderperson, user (blaster), lock tender and the employees necessary for carrying, shall be permitted to enter the air lock. No material, supplies, or equipment shall be brought through with the explosives.

(c) Primers, detonators and explosives shall be taken separately into pressure working chambers.

(d) The user (blaster) or powderperson shall be responsible for the receipt, unloading, storage, and on-site transportation of explosives and detonators.

(e) All metal pipes, rails, air locks, and steel tunnel lining shall be electrically bonded together and grounded at or near the portal or shaft, and such pipes and rails shall be cross-bonded together at not less than 1,000-foot intervals throughout the length of the tunnel. In addition, each air supply pipe shall be grounded at its delivery end.

(f) The explosives suitable for use in wet holes shall be water-resistant and shall be Fume Class 1, or other approved explosives.

(g) When tunnel excavation in rock face is approaching mixed face, and when tunnel excavation is in mixed face, blasting shall be performed with light charges and with light burden on each hole. Advance drilling shall be performed as tunnel excavation in rock face approaches mixed face, to determine the general nature and extent of rock cover and the remaining distance ahead to soft ground as excavation advances.

(13) Vibration and damage control. Blasting operations in or adjacent to cofferdams, piers, underwater structures, buildings, structures, or other facilities shall be carefully planned with full consideration for all forces and conditions involved.

(14) Black blasting powder shall not be used for blasting.

(15) No person shall store, handle, or transport explosives or blasting agents when such storage, handling, and transportation of explosives or blasting agents constitutes an undue hazard to life.

(16) It shall be unlawful for any person to abandon explosives or explosive substances.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-493, filed 3/6/95, effective 4/20/95; 92-17-022 (Order 92-06), § 296-52-493, filed 8/10/92, effective 9/10/92; 91-03-044 (Order 90-18), § 296-52-493, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-493, filed 5/6/86.]

WAC 296-52-497 Blasting agents. (1) General. Unless otherwise set forth in this section, blasting agents, excluding water gels, shall be transported, stored, and used in the same manner as explosives. Water gels are covered in WAC 296-52-501.

(2) Fixed location mixing.

(a) Buildings or other facilities used for mixing blasting agents shall be located, with respect to inhabited buildings, passenger railroads, and public highways, in accordance with Table H-20. In determining the distance separating highways, railroads, and inhabited buildings from potential explosions (as prescribed in Table H-20), the sum of all masses which may propagate (i.e., lie at distances less than prescribed in Table H-22) from either individual or combined donor masses are included. However, when the ammonium nitrate must be included, only fifty percent of its weight shall be used because of its reduced blast effects.

(b) Buildings used for the mixing of blasting agents shall conform to the requirements of this section.

(i) Buildings shall be of noncombustible construction or sheet metal on wood studs.

(ii) Floors in a mixing plant shall be of concrete or of other nonabsorbent materials.

(iii) All fuel oil storage facilities shall be separated from the mixing plant and located in such a manner that in case of tank rupture, the oil will drain away from the mixing plant building.

(iv) The building shall be well ventilated.

(v) Heating units which do not depend on combustion processes, when properly designed and located, may be used in the building. All direct sources of heat shall be located outside the mixing building.

(vi) All internal-combustion engines used for electric power generation shall be located outside the mixing plant building, or shall be properly ventilated and isolated by a firewall. The exhaust systems on all such engines shall be located so any spark emission cannot be a hazard to any materials in or adjacent to the plant.

(c) Equipment used for mixing blasting agents shall conform to the requirements of this subsection.

(i) The design of the mixer shall minimize the possibility of frictional heating, compaction, and especially confinement. All bearings and drive assemblies shall be mounted outside the mixer and protected against the accumulation of dust. All surfaces shall be accessible for cleaning.

(ii) Mixing and packaging equipment shall be constructed of materials compatible with the fuel-ammonium nitrate composition.

(iii) Suitable means shall be provided to prevent the flow of fuel oil to the mixer in case of fire. In gravity flow systems an automatic spring-loaded shutoff valve with fusible link shall be installed.

(d) The provisions of this subsection shall be considered when determining blasting agent compositions.

(i) The sensitivity of the blasting agent shall be determined by means of a No. 8 test blasting cap at regular intervals and after every change in formulation.

(ii) Oxidizers of small particle size, such as crushed ammonium nitrate prills or fines, may be more sensitive than coarser products and shall, therefore, be handled with greater care.

(iii) No hydrocarbon liquid fuel with flashpoint lower than that of No. 2 diesel fuel oil 125°F. minimum shall be used.

(iv) Crude oil and crankcase oil shall not be used.

(v) Metal powders such as aluminum shall be kept dry and shall be stored in containers or bins which are moisture-

resistant or weathertight. Solid fuels shall be used in such manner as to minimize dust explosion hazards.

(vi) Peroxides and chlorates shall not be used.

(e) All electrical switches, controls, motors, and lights located in the mixing room shall conform to the requirements in chapter 296-24 WAC, Part L; otherwise they shall be located outside the mixing room. The frame of the mixer and all other equipment that may be used shall be electrically bonded and be provided with a continuous path to the ground.

(f) Safety precautions at mixing plants shall include the requirements of this subsection.

(i) Floors shall be constructed so as to eliminate floor drains and piping into which molten materials could flow and be confined in case of fire.

(ii) The floors and equipment of the mixing and packaging room shall be cleaned regularly and thoroughly to prevent accumulation of oxidizers or fuels and other sensitizers.

(iii) The entire mixing and packaging plant shall be cleaned regularly and thoroughly to prevent excessive accumulation of dust.

(iv) Smoking, matches, open flames, spark-producing devices, and firearms (except firearms carried by law enforcement bomb squad members or qualified guards) shall not be permitted inside of or within 50 feet of any building or facility used for the mixing of blasting agents.

(v) The land surrounding the mixing plant shall be kept clear of brush, dried grass, leaves, and other materials for a distance of at least 25 feet.

(vi) Empty ammonium nitrate bags shall be disposed of daily in a safe manner.

(vii) No welding shall be permitted or open flames used in or around the mixing or storage area of the plant unless the equipment or area has been completely washed down and all oxidizer material removed.

(viii) Before welding or repairs to hollow shafts, all oxidizer material shall be removed from the outside and inside of the shaft and the shaft vented with a minimum one-half inch diameter opening.

(ix) Explosives shall not be permitted inside of or within 50 feet of any building or facility used for the mixing of blasting agents.

(3) Bulk delivery and mixing vehicles.

(a) The provisions of this subsection shall apply to off-highway private operations as well as to all public highway movements.

(b) A bulk vehicle body for delivering and mixing blasting agents shall conform with the requirements of this subsection.

(i) The body shall be constructed of noncombustible materials.

(ii) Vehicles used to transport bulk premixed blasting agents on public highways shall have closed bodies.

(iii) All moving parts of the mixing system shall be designed as to prevent a heat buildup. Shafts or axles which contact the product shall have outboard bearings with 1-inch minimum clearance between the bearings and the outside of the product container. Particular attention shall be given to the clearances on all moving parts.

(iv) A bulk delivery vehicle shall be strong enough to carry the load without difficulty and be in good mechanical condition.

(c) Operation of bulk delivery vehicles shall conform to the requirements of WAC 296-52-489(2). These include the placarding requirements as specified by department of transportation.

(i) The operator shall be trained in the safe operation of the vehicle together with its mixing, conveying, and related equipment. The employer shall assure that the operator is familiar with the commodities being delivered and the general procedure for handling emergency situations.

(ii) The hauling of either blasting caps or other explosives but not both, shall be permitted on bulk trucks provided that a special wood or nonferrous-lined container is installed for the explosives. Such blasting caps or other explosives shall be in DOT-specified shipping containers: See 49 CFR Chapter I.

(iii) No person shall smoke, carry matches or any flame-producing device, or carry any firearms while in or about bulk vehicles effecting the mixing transfer or down-the-hole loading of blasting agents at or near the blasting site.

(iv) Caution shall be exercised in the movement of the vehicle in the blasting area to avoid driving the vehicle on to or dragging hoses over firing lines, cap wires, or explosive materials. The employer shall assure that the driver, in moving the vehicle, has assistance of a second person to guide the driver's movements.

(v) No intransit mixing of materials shall be performed.

(d) Pneumatic loading from bulk delivery vehicles into blastholes primed with electric blasting caps or other static-sensitive systems shall conform to the requirements of this subsection.

(i) A positive grounding device shall be used to prevent the accumulation of static electricity.

(ii) A discharge hose shall be used that has a resistance range that will prevent conducting stray currents, but that is conductive enough to bleed off static buildup.

(iii) A qualified person shall evaluate all systems to determine if they will adequately dissipate static under potential field conditions.

(e) Repairs to bulk delivery vehicles shall conform to the requirements of this section.

(i) No welding or open flames shall be used on or around any part of the delivery equipment unless it has been completely washed down and all oxidizer material removed.

(ii) Before welding or making repairs to hollow shafts, the shaft shall be thoroughly cleaned inside and out and vented with a minimum one-half-inch diameter opening.

(4) Bulk storage bins.

(a) The bin, including supports, shall be constructed of compatible materials, waterproof, and adequately supported and braced to withstand the combination of all loads including impact forces arising from product movement within the bin and accidental vehicle contact with the support legs.

(b) The bin discharge gate shall be designed to provide a closure tight enough to prevent leakage of the stored product. Provision shall also be made so that the gate can be locked.

(c) Bin loading manways or access hatches shall be hinged or otherwise attached to the bin and be designed to permit locking.

(d) Any electrically driven conveyors for loading or unloading bins shall conform to the requirements of chapter 296-24 WAC, Part L. They shall be designed to minimize damage from corrosion.

(e) Bins containing blasting agent shall be located, with respect to inhabited buildings, passenger railroads, and public highways, in accordance with Table H-20 and separation from other blasting agent storage and explosives storage shall be in conformity with Table H-22.

(f) Bins containing ammonium nitrate shall be separated from blasting agent storage and explosives storage in conformity with Table H-22.

(5) Transportation of packaged blasting agents.

(a) When blasting agents are transported in the same vehicle with explosives, all of the requirements of WAC 296-52-489 shall be complied with.

(b) Vehicles transporting blasting agents shall only be driven by and in charge of a driver at least twenty-one years of age who is capable, careful, reliable, and in possession of a valid motor vehicle operator's license. Such a person shall also be familiar with the states vehicle and traffic laws.

(c) No matches, firearms, acids, or other corrosive liquids shall be carried in the bed or body of any vehicle containing blasting agents.

(d) No person shall be permitted to ride upon, drive, load, or unload a vehicle containing blasting agents while smoking or under the influence of intoxicants, narcotics, or other dangerous drugs.

(e) It is prohibited for any person to transport or carry any blasting agents upon any public vehicle carrying passengers for hire.

(f) Vehicles transporting blasting agents shall be in safe operating condition at all times.

(g) When offering blasting agents for transportation on public highways the packaging, marking, and labeling of containers of blasting agents shall comply with the requirements of DOT.

(h) Vehicles used for transporting blasting agents on public highways shall be placarded in accordance with DOT regulations.

(6) Use of blasting agents. Persons using blasting agents shall comply with all of the applicable provisions of WAC 296-52-493.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-497, filed 3/6/95, effective 4/20/95; 91-03-044 (Order 90-18), § 296-52-497, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-497, filed 5/6/86.]

WAC 296-52-501 Water gel (slurry) explosives and blasting agents. (1) General provisions. Unless otherwise set forth in this section, water gels and emulsions shall be transported, stored and used in the same manner as explosives or blasting agents in accordance with the classification of the product.

(2) Types and classifications.

(a) Water gels and emulsion explosives containing a substance in itself classified as an explosive shall be classified as an explosive and manufactured, transported, stored, and used as specified for "explosives" in this section, except as noted in subsection (d) of this section.

(b) Water gels and emulsion explosives containing no substance in itself classified as an explosive and which are

cap-sensitive as defined in WAC 296-52-417 under blasting agent shall be classified as an explosive and manufactured, transported, stored and used as specified for "explosives" in this section.

(c) Water gels and emulsion blasting agents containing no substance in itself classified as an explosive and which are not cap-sensitive as defined in WAC 296-52-417 under blasting agent shall be classified as blasting agents and manufactured, transported, stored, and used as specified for "blasting agents" in this section.

(d) When tests on specific formulations of water gels result in department of transportation classification as a Class B explosive, bullet-resistant magazines are not required, see WAC 296-52-453.

(3) Fixed location mixing.

(a)(i) Buildings or other facilities used for manufacturing emulsions and water gels shall be located with respect to inhabited buildings, passenger railroads and public highways, in accordance with Table H-21.

(ii) In determining the distances separating highways, railroads, and inhabited buildings from potential explosions (as prescribed in Table H-20), the sum of all masses that may propagate (i.e., lie at distances less than prescribed in Table H-22) from either individual or combined donor masses are included. However, when the ammonium nitrate must be included, only fifty percent of its weight shall be used because of its reduced blast effects.

(b) Buildings used for the manufacture of emulsions of water gels shall conform to the requirements of this subsection.

(i) Buildings shall be of noncombustible construction or sheet metal on wood studs.

(ii) Floors in a mixing plant shall be of concrete or of other nonabsorbent materials.

(iii) Where fuel oil is used all fuel oil storage facilities shall be separated from the manufacturing plant and located in such a manner that in case of tank rupture, the oil will drain away from the manufacturing plant building.

(iv) The building shall be well ventilated. Heating units that do not depend on combustion processes, when properly designed and located, may be used in the building. All direct sources of heat shall be provided exclusively from units located outside of the mixing building.

(v) All internal-combustion engines used for electric power generation shall be located outside the mixing plant building, or shall be properly ventilated and isolated by a firewall. The exhaust systems on all such engines shall be located so any spark emission cannot be a hazard to any materials in or adjacent to the plant.

(c) Ingredients of emulsion and water gels shall conform to the requirements of this subsection.

(i) Ingredients in themselves classified as Class A or Class B explosives shall be stored in conformity with WAC 296-52-461.

(ii) Nitrate-water solutions may be stored in tank cars, tank trucks, or fixed tanks without quantity or distance limitations. Spills or leaks which may contaminate combustible materials shall be cleaned up immediately.

(iii) Metal powders such as aluminum shall be kept dry and shall be stored in containers or bins which are moisture-

resistant or weathertight. Solid fuels shall be used in such manner as to minimize dust explosion hazards.

(iv) Ingredients shall not be stored with incompatible materials.

(v) Peroxides and chlorates shall not be used.

(d) Mixing equipment shall comply with the requirements of this subsection.

(i) The design of the processing equipment, including mixing and conveying equipment, shall be compatible with the relative sensitivity of the materials being handled. Equipment shall be designed to minimize the possibility of frictional heating, compaction, overloading, and confinement.

(ii) Both equipment and handling procedures shall be designed to prevent the introduction of foreign objects or materials.

(iii) Mixers, pumps, valves, and related equipment shall be designed to permit regular and periodic flushing, cleaning, dismantling, and inspection.

(iv) All electrical equipment including wiring, switches, controls, motors, and lights, shall conform to the requirements of chapter 296-24 WAC, Part L.

(v) All electric motors and generators shall be provided with suitable overload protection devices. Electrical generators, motors, proportioning devices, and all other electrical enclosures shall be electrically bonded. The grounding conductor to all such electrical equipment shall be effectively bonded to the service-entrance ground connection and to all equipment ground connections in a manner so as to provide a continuous path to ground.

(e) Mixing facilities shall comply with the fire prevention requirements of this subsection.

(i) The mixing, loading, and ingredient transfer areas where residues or spilled materials may accumulate shall be cleaned periodically. A cleaning and collection system for dangerous residues shall be provided.

(ii) A daily visual inspection shall be made of the mixing, conveying, and electrical equipment to establish that such equipment is in good operating condition. A program of systematic maintenance shall be conducted on regular schedule.

(iii) Heaters which are not dependent on the combustion process within the heating unit may be used within the confines of processing buildings, or compartments, if provided with temperature and safety controls and located away from combustible materials and the finished product.

(4) Bulk delivery and mixing vehicles.

(a) The design of vehicles shall comply with the requirements of this subsection.

(i) Vehicles used over public highways for the bulk transportation of emulsion and water gels or of ingredients classified as dangerous commodities, shall meet the requirements of the department of transportation and shall meet the requirements of WAC 296-52-489 and 296-52-497 of this section.

(ii) When electric power is supplied by a self-contained motor generator located on the vehicle the generator shall be at a point separate from where the water gel is discharged.

(iii) The design of processing equipment and general requirements shall conform to subsection (3)(c) and (d) of this section.

(iv) A positive action parking brake which will set the wheel brakes on at least one axle shall be provided on vehicles when equipped with air brakes and shall be used during bulk delivery operations. Wheel chocks shall supplement parking brakes whenever conditions may require.

(b) Operation of bulk delivery and mixing vehicles shall comply with the requirements of this subsection.

(i) The placarding requirements contained in DOT regulations apply to vehicles carrying water gel explosives or blasting agents.

(ii) The operator shall be trained in the safe operation of the vehicle together with its mixing, conveying, and related equipment. The operator shall be familiar with the commodities being delivered and the general procedure for handling emergency situations.

(iii) The hauling of either blasting caps or other explosives, but not both, shall be permitted on bulk trucks provided that a special wood or nonferrous-lined container is installed for the explosives. Such blasting caps or other explosives shall be in DOT-specified shipping containers; see 49 CFR Chapter I.

(iv) No person shall be allowed to smoke, carry matches or any flame-producing device, or carry any firearms while in or about bulk vehicles effecting the mixing, transfer, or down-the-hole loading of water gels at or near the blasting site.

(v) Caution shall be exercised in the movement of the vehicle in the blasting area to avoid driving the vehicle on to or dragging hoses over firing lines, cap wires, or explosive materials. The employer shall furnish the driver the assistance of a second person to guide the driver's movements.

(vi) No intransit mixing of materials shall be performed.

(vii) The location chosen for water gel or ingredient transfer from a support vehicle into the bore hole loading vehicle shall be away from the blasthole site when the bore holes are loaded or in the process of being loaded.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-501, filed 3/6/95, effective 4/20/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-501, filed 5/6/86.]

WAC 296-52-509 Small arms ammunition, primers, propellants and black powder. Storage, transportation, and display requirements.

(1) Scope. This section does not apply to in-process storage and intra-plant transportation during manufacture of small arms ammunition, small arms primers, and smokeless propellants.

(2) No quantity limitations are imposed on the storage of small arms ammunition in warehouses, retail stores, and other general occupancy facilities, except those imposed by limitations of storage facilities.

(3) Small arms ammunition shall be separated from flammable liquids, flammable solids as classified in 49 CFR, Part 172, and from oxidizing materials by a fire-resistant wall of one-hour rating or by a distance of 25 feet.

(4) Small arms ammunition shall not be stored together with class A or class B explosives unless the storage facility is adequate for this latter storage.

(5) Small arms smokeless propellants.

(a) Small arms smokeless propellant (class B) shall be packed, stored and transported in DOT approved shipping containers. The following shall apply.

	<u>Maximum Pounds Permitted</u>	<u>Special Restrictions</u>
Private residence or car	25 pounds or less 25 to 50 pounds	None Store in strong box or cabinet constructed of 3/4-inch plywood (minimum) or equivalent, on all sides, top and bottom.
Dealer's warehouse	150 pounds	20 to 100 pounds shall be stored in portable or fixed wooden boxes having walls at least one inch nominal thickness.
Dealer's display	75 pounds	In one pound containers.

(b) Quantities in excess of 50 pounds shall be transported in accordance with federal department of transportation regulations. Quantities in excess of 150 pounds shall be stored in approved, licensed magazines as required in WAC 296-52-441 and 296-52-453.

(c) All smokeless propellants shall be stored in shipping containers specified in 49 CFR 173.93 for smokeless propellants.

(d) Commercial stocks of smokeless propellants over 20 pounds and not more than 100 pounds shall be stored in portable wooden boxes having walls of at least 1 inch nominal thickness.

(e) Commercial stocks in quantities not to exceed 150 pounds shall be stored in nonportable storage cabinets having wooden walls of at least 1 inch nominal thickness.

(f) Quantities in excess of 150 pounds shall be stored in magazines in accordance with WAC 296-52-461.

(6) Small arms ammunition primers.

(a) Small arms ammunition primers shall be packed, stored, and transported in DOT approved shipping containers. They shall be separate from flammable liquids, flammable solids, and oxidizing materials by a fire-resistant wall of one-hour rating or by a distance of 25 feet. The following shall also apply.

	<u>Maximum Number Permitted</u>	<u>Special Restrictions</u>
Private residence	10,000 primers	None
Private car	25,000 primers	None
Dealer's display	10,000 primers	None

Dealer's warehouse ——— 750,000 primers ——— No more than 100,000 shall be stored in a pile and piles shall be separated by at least 15 feet.

(b) Quantities in excess of 750,000 primers shall be stored in approved, licensed magazines as required by WAC 296-52-441 and 296-52-453.

(7) Black powder, as used in muzzle loading firearms, shall be packed, stored and transported in DOT approved shipping containers and the following shall apply.

	<u>Maximum Pounds Permitted</u>	<u>Special Restrictions</u>
Private residence	5 pounds	None
Private car	5 pounds	None
Dealer's warehouse	25 pounds	None
Dealer's display	4 pounds	In one pound containers.

(8) Quantities in excess of 25 pounds of black powder, as used in muzzle loading firearms, shall be stored in approved, licensed magazines as required by WAC 296-52-441 and 296-52-453.

(9) Black powder manufactured for muzzle loading firearms shall not be used for blasting operations.

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-509, filed 3/6/95, effective 4/20/95; 90-03-029 (Order 89-20), § 296-52-509, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-509, filed 5/6/86.]

WAC 296-52-550 Appendix I—IME two-compartment transportation units (mandatory). Storage of blasting caps (detonators) in the same magazine with other explosives is prohibited by WAC 296-52-457. The department of labor and industries (DLI) recognizes that it is often operationally desirable to transport both caps and other explosives in the same vehicle or trailer unit. Then, after the explosives laden vehicle arrives at the blast site, to utilize that vehicle and/or trailer unit as a mobile "day box" from which to dispense explosives into loading operations or into storage magazines.

The Institute of Makers of Explosives (IME) pamphlet No. 22, as revised in 1993, publishes construction criteria for two-compartment transportation units which are accepted by both the Bureau of Alcohol, Tobacco and Firearms (ATF) and U.S. Department of Transportation (DOT) for this purpose.

(1) Department of labor and industries will accept these "IME transportation units" as being approved for transporting both caps and explosives in the same vehicle or trailer, subject to the following:

(a) The dual-compartment units are constructed to the applicable IME specifications which are published in this Appendix I for the convenience of state users; and

(b) The units are correctly maintained and used in accordance with applicable federal regulations and this chapter (see in particular WAC 296-52-489); and

(c) Only blasting caps which are classified by DOT as being nonmass-detonating are permitted to be transported in dual compartment units; and

(d) Detonators shall not be transported in the same compartment with other explosives or blasting agents; and

(e) Both the detonators and explosives, in separate appropriate compartments, shall be contained in the original DOT approved packages/containers; and

(f) The packages/containers shall be stacked or otherwise restrained from being easily displaced about the compartment during transit; and

(g) Even though constructed on the same motor vehicle or trailer frame, each compartment will be considered a separate container with individual construction and security requirements; and

(h) These IME transportation units are constructed to specifications which are greatly less bullet resistant and theft resistant than standard portable magazines. For that reason, these units cannot be utilized for unattended storage in this state; and

(i) On two compartment units, both compartments must be securely attached to the vehicle or trailer.

(2) Construction specifications.

(a) Each compartment must provide for total enclosure of the blasting caps or explosives.

(b) The partition between the explosives storage compartment and the blasting cap compartment must be of laminate construction consisting of A/C grade or better exterior plywood, gypsum board (sheetrock) and low carbon steel plates. In order of arrangement, the laminate must conform to the following, with minimum thickness of each lamination as indicated:

- 1/2 Inch plywood;
- 1/2 Inch gypsum board (sheetrock);
- 1/8 Inch low carbon steel; and
- 1/4 Inch plywood.

With the 1/4 inch plywood facing the explosives storage compartment.

See Appendix I-C for details of laminate construction. The door to the blasting cap compartment must be of metal construction or solid wood covered with metal. The outside walls and top must be of the same construction as the rest of the vehicle or trailer.

(c) As an alternative to the construction requirements shown in (b) of this subsection, a container for use only as illustrated in Appendix I-A may be used when constructed as follows:

(i) The top, lid or door, and the sides and bottom of each container must be of laminate construction consisting of A/C grade or better exterior plywood, solid hardwood, gypsum board (sheetrock), and sheet metal. In order of arrangement, the laminate must conform to the following, with minimum thickness of each lamination as indicated:

- 1/4 Inch plywood;
- 1 Inch solid hardwood;
- 1/2 Inch plywood;
- 1/2 Inch gypsum board (sheetrock)
- (or 1/4 inch particle board); and
- 22 Gauge sheet metal.

Constructed inside to outside in that order. See Appendix I-D for detail of laminate construction.

(ii) The hardwood must be fastened together with wood screws, the 1/2 inch plywood must be fastened to the hardwood with wood screws, the inner 1/4 inch plywood must be fastened to the hardwood with adhesive, and the 22 gauge sheet metal must be attached to the exterior of the container with screws.

(d) The laminate composite material must be securely bound together by waterproof adhesive or other equally effective means.

(e) The steel plates at the joints of laminations must be secured by continuous fillet welds.

(f) All interior surfaces of the container or compartment must be constructed so as to prevent contact of contents with any sparking metal.

(g) There must be direct access into each compartment from outside the vehicle.

(h) Each container or compartment must have a snug fitting continuous piano-type hinged lid or door equipped with a locking device (or devices).

(i) Without permitting direct access to contents under normal conditions, the locking or hinging mechanisms must permit at least one edge of the lid or door to rise or move outward at least 1/2 inch when subjected to internal pressure.

(j) The exterior of the container or compartment must be weather-resistant.

Part H, Appendices
Chapter 296-52 WAC
Safety Standards for the Possession
and Handling of Explosives

APPENDIX I-A

PERMANENTLY MOUNTED CONTAINERS

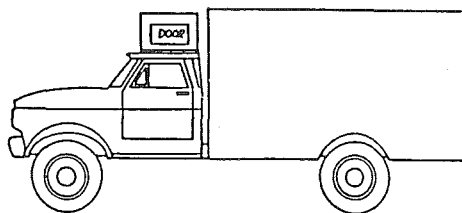


Figure 1

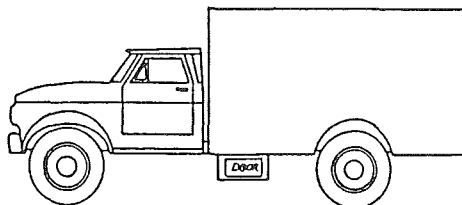


Figure 2

NOTE: The configurations shown in Figures 1 and 2 are equally applicable to multi-axle and "cab-over" vehicles.

[Diagrams: Courtesy of IME]

APPENDIX I-B

COMPARTMENTS

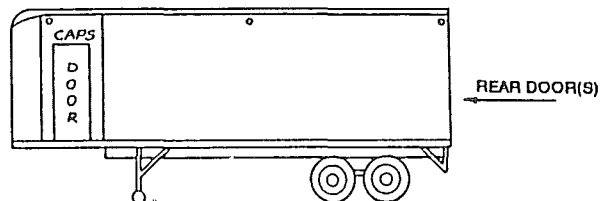


Figure 1

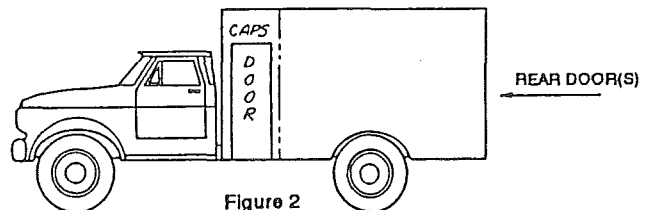


Figure 2

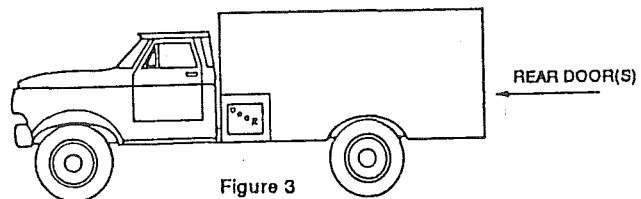


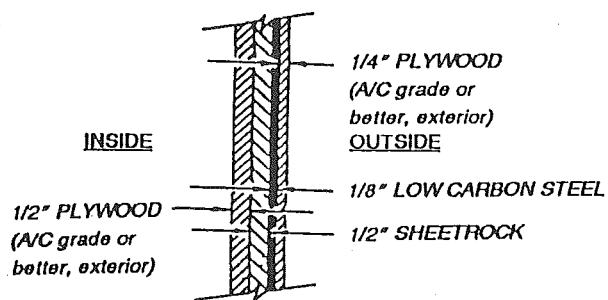
Figure 3

NOTE: The configurations shown in Figures 1 and 2 are equally applicable to multi-axle and "cab-over" vehicles.

[Diagrams: Courtesy of IME]

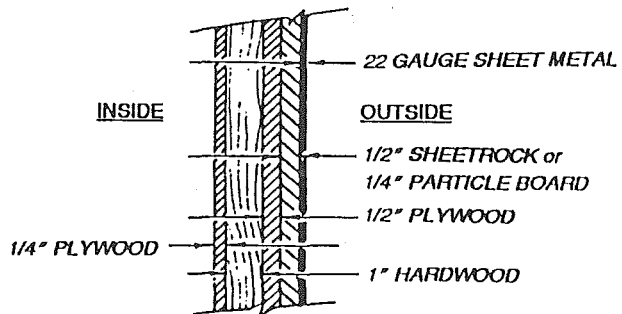
Part H, Appendices
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APPENDIX I-C



Sketch of laminate construction for container or compartment for electric blasting caps use, as illustrated in Appendix A, B, and E.

APPENDIX D



Sketch of laminate construction for container or compartment for electric blasting caps; restricted to use as illustrated in Appendix A.

[Diagrams: Courtesy of IME]

APPENDIX I-E

PORTABLE WHEELED TRAILERS

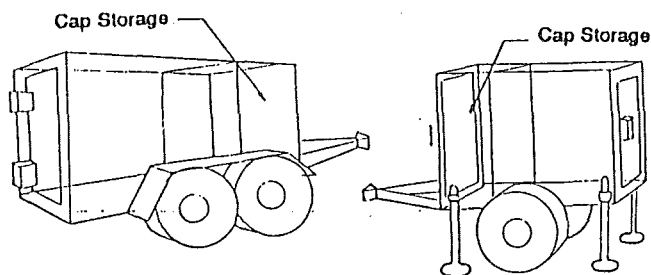


Figure 1

Figure 3

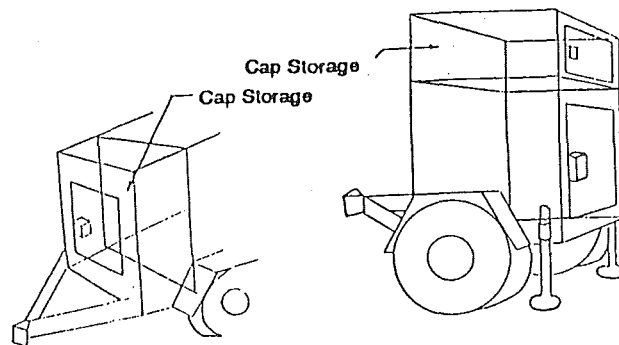


Figure 2

Figure 4

WAC 296-52-552 Appendix II—Radio frequency warning signs (mandatory). (1) This chapter requires that blasters using electric blasting caps shall post warning signs to prohibit the use of radio frequency transmitters within a clearance zone around all locations where the electric caps are being used. This appendix provides specific sign illustrations and posting instructions.

(a) In construction operations, including demolition, the clearance zone around electric caps shall be 1000 feet.

(b) In general industry operations not subject to construction requirements, the clearance zone around electric caps shall be 350 feet.

(c) On public highways, the Washington utilities and transportation commission and Washington department of transportation requires compliance with ANSI D6.1-1988, the *Uniform Traffic Control Devices* manual. On private roads under the jurisdiction of the department of labor and industries, strict compliance with ANSI is not required provided that: All roads or right of ways where RF transmitters would be carried are adequately posted to achieve the necessary notice; the signs are maintained in the necessary positions throughout the time when electric caps are present.

(2) Signs shall be reflectorized or illuminated to show the same shape, color and wording in both daylight or night when blasting is being done during hours of darkness.

(3) The signs shall be "CONSTRUCTION ORANGE" with black letters and borders, all upper case letters, not less than the sizes shown.

Note: Larger signs may be required where the highway speed limit is more than 55 M.P.H.

(4) Site survey.

(a) To comply with this section, the blaster in charge shall conduct, or cause to be conducted, an accurate survey of the entire intended blast site. The survey shall determine the clearance points where any road(s) or right-of-way(s) enter and exit the required clearance zone.

(b) If the blast zone moves along as the job progresses, the 1000 foot clearance zone shall be adjusted to correctly maintain the permissible clearance borders at all times.

(5) The "TURN OFF 2-WAY RADIO" sign shall be posted at the beginning of the blast zone minimum clearance point.

(6) The "BLASTING ZONE 1000 FEET" sign shall be posted in sequence 1000 feet ahead of the "TURN OFF 2-WAY RADIO" sign.

In very slow vehicle travel zones such as off-road construction right-of-ways, rock pits or quarries, the separation distance between the signs may be reduced to as little as 300 feet.

(7) The "END BLASTING ZONE" sign shall be posted past the point where the blasting zone clearance limit ends.

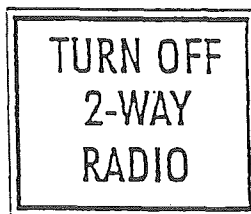
(8) The warning signs required by the appendix shall be prominently displayed at all times when blasting operations are being conducted with an electric blasting cap initiation system. Blasting operations being conducted shall include any and all times when electric caps are present and have been removed from the original DOT approved shipping container.

(9) The blasting signs shall be covered or removed when blasting operations are not being conducted.

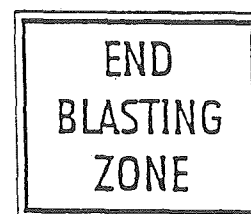
STANDARD WARNING SIGNS



W22-1
48" x 48"



W22-2
42" x 36"

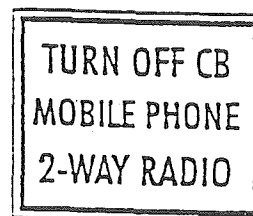


W22-3
42" x 36"

(10) New "TURN OFF 2-WAY RADIO" signs purchased after the effective date of this standard shall be modified to read "TURN OFF CB, MOBILE PHONE, 2-WAY RADIO."

(a) Modified signs may be used in place of the currently required sign immediately.

(b) Modified signs shall replace all currently required 2-way radio signs before January 1, 2000.



42" x 36"

[Statutory Authority: Chapter 49.17 RCW. 95-07-014, § 296-52-552, filed 3/6/95, effective 4/20/95.]

WAC 296-52-555 Appendix III—ATF regulations.
U.S. Department of Transportation Regulations as Excerpted
from 49 CFR Part 173, 10/01/92 Edition.

Subpart C—Definitions, Classification, and Packaging for Class 1

Source: Amdt. 173-224, 55 FR 52617, Dec. 21, 1990, unless otherwise noted.

§ 173.50 Class 1—definitions. (a) Explosive. For the purpose of this subchapter, an *explosive* means any substance or article, including a device, which is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion, unless the substance or article is otherwise classed under the provision of this subchapter.

(b) Explosives in Class 1 are divided into six divisions as follows:

(1) *Division 1.1* consists of explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.

(2) *Division 1.2* consists of explosives that have a projection hazard but not a mass explosion hazard.

(3) *Division 1.3* consists of explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

(4) *Division 1.4* consists of explosives that present a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of this package.

(5) *Division 1.5*¹ consists of very insensitive explosives. This division is comprised of substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.

(6) *Division 1.6*² consists of extremely insensitive articles which do not have a mass explosive hazard. This division is comprised of articles which contain extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.

¹The probability of transition from burning to detonation is greater when large quantities are transported in a vessel.

²The risk from articles of *Division 1.6* is limited to the explosion of a single article.

§ Classification codes and compatibility groups of explosives.

(a) This classification code for an explosive, which is assigned by the Associate Administrator for Hazardous Materials Safety in accordance with this subpart, consists of the division number followed by the compatibility group letter. Compatibility group letters are used to specify the controls for the transportation, and storage related thereto, of explosives and to prevent an increase in hazard that might result if certain explosives were stored together. Transportation compatibility requirements for carriers are prescribed in § § 174.81, 175.78, 176.83 and 177.848 of this subchapter for transportation by rail, air, vessel, and public highway, respectively, and storage incidental thereto.

(b) Compatibility groups and classification codes for the various types of explosives are set forth in the following table. The table sets forth compatibility groups and classification codes for substances and articles described in the first column.

TABLE 1 - CLASSIFICATION CODES

Description of substances or article to be classified	Compatibility Group	Classification Code
Primary explosive substance.	A	1.1A
Article containing a primary explosive substance and not containing two or more effective protective features.	B	1.1B 1.2B 1.4B
Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance.	C	1.1C 1.2C 1.3C 1.4C
Secondary detonating explosive substance or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and containing two or more effective protective features.	D	1.1D 1.2D 1.4D 1.5D
	E	1.1E 1.2E 1.4E

Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid).	F	1.1F
		1.2F
		1.3F
		1.4F
Article containing a secondary detonating explosive substance with its means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid) or without a propelling charge.	G	1.1G
		1.2G
		1.3G
		1.4G
Pyrotechnic substance or article containing a pyrotechnic substance, or article containing both an explosive substance and an illuminating incendiary, tear-producing or smoke-producing substance (other than a water-activated article or one containing white phosphorus, phosphide or flammable liquid or gel or hypergolic liquid).	H	1.2H
		1.3H
	J	1.1J
		1.2J
		1.3J
Article containing both an explosive substance and white phosphorus.	K	1.2K
		1.3K
	L	1.1L
		1.2L
Article containing both an explosive substance and flammable liquid or gel.	N	1.6N
		1.4S
Article containing both an explosive substance and a toxic chemical agent.	S	1.4S
		1.4S
Risk (e.g., due to water-activation or presence of hypergolic liquids, phosphide or pyrophoric substances) needing isolation of each type.		
Articles containing extremely insensitive detonating substances.		

§ 173.53 Provisions for using old classifications of explosives.

Where the classification system in effect prior to January 1, 1991, is referenced in State or local laws, ordinances or regulations not pertaining to the transportation of hazardous materials, the following table may be used to compare old and new hazard class names:

Current Classification	Class Name Prior to January 1, 1991
Division 1.1	Class A explosives
Division 1.2	Class A or Class B explosives
Division 1.3	Class B explosives
Division 1.4	Class C explosives
Division 1.5	Blasting agents
Division 1.6	No applicable hazard class

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<p>Bureau of Alcohol, Tobacco and Firearms</p> <p>[Notice No. 695]</p> <p>COMMERCE IN EXPLOSIVES; LIST OF EXPLOSIVE MATERIALS</p> <p>Pursuant to the provisions of section 6-11(d) of Title 18, United States Code, and 27 CFR 53.23, the Director, Bureau of Alcohol, Tobacco and Firearms, must publish and revise at least annually in the Federal Register a list of explosives determined to be within the coverage of 18 U.S.C. Chapter 40, Importation, Manufacture, Distribution, and Storage of Explosive Materials. This Chapter covers not only explosives, but also blasting agents and detonators, all of which are defined as explosive materials in section 841(c) of Title 18, United States Code. Accordingly, the following is the 1989 List of Explosive Material subject to regulation under 18 U.S.C. Chapter 40, which includes both the list of explosives (including detonators) required to be published in the Federal Register and blasting agents. This list is intended to include any and all mixtures containing any of the materials in the list. Materials constituting blasting agents are marked by an asterisk. While the list is comprehensive, it is not all inclusive. The fact that an explosive material may not be on the list does not mean that it is not within the coverage of the law if it otherwise meets the statutory definitions in Section 841 of Title 18, United States Code. Explosive materials are listed alphabetically by their common names followed by chemical names and synonyms in brackets. This revised list supersedes the List of Explosive Materials dated December 28, 1988 (53 FR 52561) and will be effective as of January 12, 1990.</p> <p>List of Explosive Materials</p> <p>A</p> <p>Acetylides of heavy metals. Aluminum containing polymeric propellant. Aluminum ophomite explosive. Amatex. Amatol. Ammonal. Ammonium nitrate explosive mixtures (cap sensitive). Ammonium nitrate explosive mixtures (non</p>	<p>Ammonium perchlorate having particle size less than 15 microns. Ammonium perchlorate composite propellant. Ammonium picrate (picrate of ammonia, Explosive D). ammonium salt lattice with isomorphously substituted inorganic salts. ANFO (ammonium nitrate-fuel oil).</p> <p>B</p> <p>Baratol. Baronol. BEAF (1,2-bis (2-3-difluoro-2-nitroacetoxyethane)). Black powder. Black powder based explosive mixtures. Blasting agents, nitro-carbo-nitrates, including non cap sensitive slurry and water-gel explosives Blasting caps. Blasting gelatin. Blasting powder. BTNEC (bis (trinitroethyl) carbonate). BTNEN (bis (trinitroethyl) nitramine). BTTN (1,2,4 butanetriol trinitrate). Butyl tetryl.</p> <p>C</p> <p>Calcium nitrate explosive mixture. Cellulose hexanitrate explosive mixture. Chlorate explosive mixtures. Composition A and variations. Composition B and variations. Composition C and variations. Copper acetylide. Cyanuric trioxide. Cyclotrimethylenetrinitramine (RDX). Cyclotetramethylenetetranitramine (HMX). Cyclonite (RDX). Cyclotol.</p> <p>D</p> <p>DATB (diaminotrinitrobenzene). DDNP (diazodinitrophenol). DEGND (diethyleneglycol dinitrate). Detonating cord. Detonators. Dimethylol dimethyl methane dinitrate composition. Dinitroethylenes. Dinitroglycerine (glycerol dinitrate). Dinitrophenol. Dinitrophenolates.</p>	<p>Dinitrotolnene-sodium nitrate explosive mixtures. DIPAM. Dipicryl sulfone. Dipicrylamina DNDP (dinitropentano nitrile).</p> <p>E</p> <p>EDDN (ethylene diamine dinitrate) EDNA Ednatol EDNP (ethyl 4,4-ddipitropentanoate) Erythritol tetranitrate explosives Eslers of nitro-substituted alcohols EGDN (ethylene glycol dinitrate) Ethyl-tetryl Explosive conitrates Explosive gelatins Explosive mixtures containing oxygen releasing inorganic salts and hydrocarbons Explosive mixtures containing oxygen releasing inorganic salts and nitro bodies Explosive mixtures containing oxygen releasing inorganic salts and water insoluble fuels Explosive mixtures containing oxygen releasing inorganic salts and water soluble fuels Explosive mixtures containing sensitized nitromethane Explosive mixtures containing tetraintromethane (nitroform) Explosive nitro compounds of aromatic hydrocarbons Explosive organic nitrate mixtures Explosive liquids Explosive powders</p> <p>F</p> <p>Flash powder Fulminate of mercury Fulminate of silver Fulminating gold Fulminating mercury Fulminating platinum Fluminating silver</p>
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G	Mercury oxalate Nitric acid and carboxylic fuel explosive Nitric acid explosive mixtures Nitro aromatic explosive mixtures Mercury tarrate Metriol trinitrate Minol-2 [40% TNT, 40% ammonium nitrate, 20% aluminum] MMAN [monomethylamine nitrate]; methylamine nitrate Mononitrotoluene-nitroglycerin mixture Monopropellants	P
Gelatinized nitrocellulose Gem-dinitro aliphatic explosive mixtures Guanyl nitrosamino tetrazene Guanyl nitrosamino guanylidene hydrazine		PBX [RDX and plasticizer] Pellet Powder Penthrinite composition Pentolite PYX [2,6-bis(picrylamino)-3,5- dinitropyridine Perchlorate explosive mixtures Peroxide based explosive mixtures PETN [nitropentaerythrite, pentaerythrite tetranitrate, pentaerythritol tetranitrate] Picramic acid and its salts Picramide Picrate of potassium explosive mixtures Picratol Picric acid (manufactured as an explosive) Picryl chloride Picryl fluoroide PLX [95% nitromethane, 5% ethylenediamine] Polynitro aliphatic compounds Polyolpolynitrate-nitrocellulose explosive gels Potassium chlorate and lead sulfocyanate explosive Potassium nitrate explosive mixtures Potassium Nitroaminotetrazole
H	N	R
Heavy metal azides Hexanite Hexanitrodiphenylamine Hexanitrostilbene Hexogen [RDX] Hexogene or octogene and a nitrated N-methylaniline Hexolites HMX [cyclo-1,3,5,7-tetramethylene- 2,4,6,8-tetranitramine; Octogen] Hydrazinium nitrate/hydrazine/aluminum explosive system Hydrazoic acid	NIBTN [nitroisobutametrial trinitrate] Nitrate sensitized with gelled nitropraffin Nitrated carbohydrate explosives Nitrated glucoside explosive Nitrated polyhydric alcohol explosives Nitrates of soda explosive mixtures Nitric acid and a nitro aromatic compound explosive Nitro compounds of furane explosive mixtures Nitrocellulose explosive Nitroderivative of urea explosive mixture Nitrogelatin explosive Nitrogen trichloride Nitrogen tri-iodide Nitroglycerine [NG, RNG, nitro, glyceryl trinitrate, trinitroglycerine] Nitroglycide Nitroglycol (ethylene glycol dinitrate, EGDN) Nitroguanidine explosives Nitroparaffins Explosive Grade and ammonium nitrate mixtures Nitronium perchlorate propellant mixtures Nitrostrach Nitro-substituted carboxylic acids Nitrourea	RDX [cyclonite, hexogen, T4, cyclo-1,3,5,- trimethylene-2,4,6,-trinitramine; hexahydro-1,3,5-trinitro-S-triazine]
I	O	S
Igniter cord Igniters Initiating tube systems	Octogen [HMX] Octol [75% HMX, 25% TNT] Organic amine nitrates Organic nitramines	Safety fuse Salutes, (bulk) Salts of organic ammimo sulfonic acid explosive mixtures Silver acetyline Silver azide Silver fulminate Silver oxalate explosive mixtures Silver styphnate Silver tartrate explosive mixtures Silver tetrazene Slurried explosive mixtures of water, inorganic oxidizing salts, gelling agent, fuel and sensitizer (cap sensitive) Smokeless powder Sodatol Sodium amatol
K		
KDNBF [potassium dinitrobenzo-furoxane]		
L		
Lead azide Lead mannite Lead mononitroresorcinate Lead picrate Lead salts, explosive Lead styphnate [styphnate of lead, lead trinitroresorcinate] Liquid nitrated polyol and trimethylolethane Liquid oxygen explosives		
M		
Magnesium ophorite explosives Mannitol hexanitrate MDNP [methyl 4,4-dinitropentanoate] MEAN [monoethanolamine nitrate] Mercuric fulminate		

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<p>Sodium azide explosive mixture Sodium dinitro-ortho-cresolate Sodium nitrate-potassium nitrate explosive mixture Sodium picramate Special fireworks Squibs Stypnic acid explosives</p> <p>T</p> <p>Tacot [tetranitro-2,3,5,6-dibenzo-1,3a, 4,6a-tetrazapentalene] TATB [triaminotrinitrobenzene] TEGDN [triethylene glycol dinitrate] Tetrazene [tetracene, tetrazine, 1(5-tetrazol)-4-guanyl tetrazene hydrate] Tetranitrocarbazole Tetryl [2,4,6 tetranitro-N-methylaniline] Tetrytol Thickened inorganic oxidizer salt slurried explosive mixture TMETN (trimethylolethane trinitrate) TNEF [trinitroethyl formal] TNEOC [trinitroethyl orthocarbonate] TNEOF [trinitroethyl orthoformate] TNT [trinitrotoluene, trotyl, trilit, triton] Tropex Tridite Trimethylol ethyl methane trinitrate composition Trimethylolthane trinitrate-nitrocellulose Trimonite Trinitroanisole Trinitrobenzene Trinitrobenzoic acid Trinitrocresol Trinitro-meta-cresol Trinitronaphthalene Trinitrophenetol Trinitrophloroglucinol Trinitroresorcinol Tritonal</p> <p>U</p> <p>Urea nitrate</p> <p>W</p> <p>Water bearing explosives having salts of oxidizing acids and nitrogen bases, sulfates, or sulfamates (cap sensitive)</p>	<p>Water-in-oil emulsion explosive compositions</p> <p>X</p> <p>Xanthamomas hydrophilic colloid explosive mixture</p> <p>FOR FURTHER INFORMATION CONTACT: Linda Deel, Specialist, Firearms and Explosives Operations Branch, Bureau of Alcohol, Tobacco and Firearms, 650 Massachusetts Avenue, NW., Washington DC 20226 (202) 927-8310</p> <p>Approved: January 2, 1992.</p>	
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Chapter 296-56 WAC
SAFETY STANDARDS—LONGSHORE,
STEVEDORE AND RELATED WATERFRONT
OPERATIONS

WAC

296-56-60001	Scope and applicability.
296-56-60003	Variance and procedure.
296-56-60005	Definitions.
296-56-60009	Accident prevention program.
296-56-60062	First-aid kit.
296-56-60073	Miscellaneous auxiliary gear.
296-56-60083	Cranes and derricks.
296-56-60093	Certification of marine terminal material handling devices.
296-56-60095	Advisory crane certification panel.
296-56-60097	Unit proof load test and inspection.
296-56-60098	Examination and inspection of cranes and derricks.
296-56-60235	Welding, cutting and heating (hot work).

WAC 296-56-60001 Scope and applicability. (1) The rules included in this chapter apply throughout the state of Washington, to any and all waterfront operations under the jurisdiction of the department of labor and industries, division of consultation and compliance.

(2) These minimum requirements are promulgated in order to augment the general safety and health standards, and any other safety and health standards promulgated by the department of labor and industries which are applicable to all places of employment under the jurisdiction of the department of labor and industries. The rules of this chapter, and the rules of chapters 296-24 and 296-62 WAC are applicable to all longshore, stevedore and related waterfront operations: *Provided*, That such rules shall not be applicable to those operations under the exclusive safety jurisdiction of the federal government.

(3) The provisions of this chapter shall prevail in the event of a conflict with, or duplication of, provisions contained in chapters 296-24 and 296-62 WAC. Specific standards which are applicable include, but are not limited to:

(a) Electrical—Chapter 296-24 WAC Part L.

(b) Toxic and hazardous substances are regulated by chapter 296-62 WAC. Where references to this chapter are given they are for informational purposes only. Where specific requirements of this chapter conflict with the provisions of chapter 296-62 WAC this chapter prevails. Chapter 296-62 WAC does not apply when a substance or cargo is contained within a manufacturer's original, sealed, intact means of packaging or containment complying with the department of transportation or International Maritime Organization requirements.

(c) Hearing conservation—Chapter 296-62 WAC Part K.

(d) Standards for commercial diving operations—Chapter 296-37 WAC.

(e) Safety requirements for scaffolding—Chapter 296-24 WAC Part J-1.

(f) Safe practices of abrasive blasting operations—Chapter 296-24 WAC Part H-2.

(g) Access to employee exposure and medical records—Chapter 296-62 WAC Part B.

(h) Respiratory protection—Chapter 296-62 WAC Part E.

(i) Safety standards for grain handling facilities—Chapter 296-99 WAC.

(j) Hazard communication purpose—Chapter 296-62 WAC Part C.

(k) Asbestos—Chapters 296-62 Part I-1 and 296-65 WAC.

(l) Permit - required confined spaces and confined space—Chapter 296-62 WAC Part M.

(m) Servicing multi-piece and single-piece rim wheels—Chapter 296-24 WAC Part D.

(4) The provisions of this chapter do not apply to the following:

(a) Fully automated bulk coal handling facilities contiguous to electrical power generating plants.

(b) Facilities subject to the regulations of the office of pipeline safety regulation of the materials transportation bureau, department of transportation, to the extent such regulations apply.

(5) WAC 296-62-074 shall apply to the exposure of every employee to cadmium in every employment and place of employment covered by chapter 296-56 WAC in lieu of any different standard on exposures to cadmium that would otherwise be applicable by virtue of those sections.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60001, filed 1/18/95, effective 3/1/95; 93-07-044 (Order 93-01), § 296-56-60001, filed 3/13/93, effective 4/27/93. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-56-60001, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-56-60001, filed 11/22/91, effective 12/24/91; 89-11-035 (Order 89-03), § 296-56-60001, filed 5/15/89, effective 6/30/89; 88-14-108 (Order 88-11), § 296-56-60001, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60001, filed 1/17/86; 85-10-004 (Order 85-09), § 296-56-60001, filed 4/19/85; 85-01-022 (Order 84-24), § 296-56-60001, filed 12/11/84.]

WAC 296-56-60003 Variance and procedure. Conditions may exist under which certain state standards will not have practical application. In these cases, the director of the department of labor and industries has made provisions for the issuance of variances. The director or his/her authorized representative may, pursuant to this section, RCW 49.17.080 and 49.17.090, and WAC 296-350-200 through 296-350-270, upon receipt of application and after investigation by the department, permit a variation from the requirements of this chapter. Any variance is limited to the particular case and application. It shall remain posted during the time which it is in effect. Variance application forms may be obtained from the department.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60003, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60003, filed 1/17/86; 85-01-022 (Order 84-24), § 296-56-60003, filed 12/11/84.]

WAC 296-56-60005 Definitions. (1) "Apron" means that open portion of a marine terminal immediately adjacent to a vessel berth and used in the direct transfer of cargo between the terminal and vessel.

(2) "Assistant director for the division of consultation and compliance" means the assistant director of consultation and compliance, department of labor and industries or his/her authorized representative.

(3) "Authorized," in reference to an employee's assignment, means selected by the employer for that purpose.

(4) "Cargo door" (transit shed door) means a door designed to permit transfer of cargo to and from a marine terminal structure.

(5) "Cargo packaging" means any method of containment for shipment, including cases, cartons, crates and sacks, but excluding large units such as intermodal containers, vans or similar devices.

(6) "Confined space" means a space that:

(a) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(b) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and

(c) Is not designed for continuous employee occupancy.

(7) "Conveyor" means a device designed exclusively for transporting bulk materials, packages or objects in a predetermined path and having fixed or selective points of loading or discharge.

(8) "Danger zone" means any place in or about a machine or piece of equipment where an employee may be struck by or caught between moving parts, caught between moving and stationary objects or parts of the machine, caught between the material and a moving part of the machine, burned by hot surfaces or exposed to electric shock. Examples of danger zones are nip and shear points, shear lines, drive mechanisms, and areas beneath counterweights.

(9) "Designated person" means a person who possesses specialized abilities in a specific area and is assigned by the employer to perform a specific task in that area.

(10) "Dock" means a wharf or pier forming all or part of a waterfront facility, including marginal or quayside berthing facilities; not to be confused with "loading dock" as at a transit shed or container freight station, or with the body of water between piers or wharves.

(11) "Dock facilities" includes all piers, wharves, sheds, aprons, dolphins, cranes, or other gear or equipment owned or controlled by the dock or facility owner, where cargo or materials are loaded, moved or handled to or from a vessel.

(12) "Dockboard" (bridge plate or car plate) means a device utilized to span the gap between railroad cars, or between railroad cars or highway vehicles and the loading dock or platform. A car plate may be fixed, adjustable, portable, powered, or unpowered.

(13) "Enclosed space" means an indoor space, other than a confined space, that may contain or accumulate a hazardous atmosphere due to inadequate natural ventilation. Examples of enclosed spaces are trailers, railcars, and storage rooms.

(14) "Examination," as applied to material handling devices required to be certified by this chapter, means a comprehensive survey consisting of the criteria outlined in WAC 296-56-60093 through 296-56-60097. The examination is supplemented by a unit proof test in the case of annual survey.

(15) "Flammable atmosphere" means an atmosphere containing more than ten percent of the lower flammable limit (LEL) of a flammable or combustible vapor or dust

mixed with air. Such atmospheres are usually toxic as well as flammable.

(16) "Front-end attachments."

(a) As applied to power-operated industrial trucks, means the various devices, such as roll clamps, rotating and sideshifting carriages, magnets, rams, crane arms or booms, load stabilizers, scoops, buckets, and dumping bins, attached to the load end for handling lifts as single or multiple units.

(b) As applied to cranes, means various attachments applied to the basic machine for the performance of functions such as lifting, clamshell or magnet services.

(17) "Fumigant" is a substance or mixture of substances, used to kill pests or prevent infestation, which is a gas or is rapidly or progressively transformed to the gaseous state even though some nongaseous or particulate matter may remain and be dispersed in the treatment space.

(18) "Hazardous cargo, material, substance or atmosphere" means:

(a) Any substance listed in chapter 296-62 WAC;

(b) Any material in the hazardous materials table and hazardous materials communications regulations of the Department of Transportation, 49 CFR Part 172;

(c) Any article not properly described by a name in the hazardous materials table and hazardous materials communications regulations of the Department of Transportation, 49 CFR Part 172, but which is properly classified under the definition of those categories of dangerous articles given in 49 CFR Part 173;

(d) Atmospheres having concentrations of airborne chemicals in excess of permissible exposure limits as defined in chapter 296-62 WAC; or

(e) Any atmosphere with an oxygen content of less than nineteen and one-half percent by volume.

(19) "House falls" means spans and supporting members, winches, blocks, and standing and running rigging forming part of a marine terminal and used with a vessel's cargo gear to load or unload by means of married falls.

(20) "Inspection," as applied to material handling devices required to be certified by this chapter, includes a complete visual examination of all visible parts of the device.

(21) "Intermodal container" means a reusable cargo container of rigid construction and rectangular configuration intended to contain one or more articles of cargo or bulk commodities for transportation by water and one or more other transport modes without intermediate cargo handling. The term includes completely enclosed units, open top units, fractional height units, units incorporating liquid or gas tanks and other variations fitting into the container system, demountable or with attached wheels. It does not include cylinders, drums, crates, cases, cartons, packages, sacks, unitized loads or any other form of packaging.

(22) "Loose gear" means removable or replaceable components of equipment or devices which may be used with or as a part of assembled material handling units for purposes such as making connections, changing line direction and multiplying mechanical advantage. Examples include shackles and snatch blocks.

(23) "Marina" means a small harbor or boat basin providing dockage, supplies, and services for small craft.

(24) "Marine terminal" means wharves, bulkheads, quays, piers, docks and other berthing locations and adjacent

storage or contiguous areas and structures associated with the primary movement of cargo or materials from vessel to shore or shore to vessel. It includes structures which are devoted to receiving, handling, holding, consolidation, loading or delivery of waterborne shipments and passengers, and areas devoted to the maintenance of the terminal or equipment. The term does not include production or manufacturing areas having their own docking facilities and located at a marine terminal nor storage facilities directly associated with those production or manufacturing areas.

(25) "Permit-required confined space (permit space)" means a confined space that has one or more of the following characteristics:

(a) Contains or has a potential to contain a hazardous atmosphere;

(b) Contains a material that has the potential for engulfing an entrant;

(c) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or

(d) Contains any other recognized serious safety or health hazard.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60005, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-56-60005, filed 10/30/92, effective 12/8/92. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60005, filed 1/17/86; 85-01-022 (Order 84-24), § 296-56-60005, filed 12/11/84.]

WAC 296-56-60009 Accident prevention program.

(1) An accident prevention program, which provides equitable management-employee participation, shall be established in all establishments, industrial plants, or operations.

(2) It shall be the responsibility of the employer to initiate and maintain the accident prevention program necessary to comply with this section. The division of consultation and compliance may be contacted for assistance in initiating and maintaining an effective accident prevention program.

(3) All accident prevention programs shall be tailored to the needs of the particular operation.

(4) Employer and employee representatives, as elected, delegated or appointed, shall attend and actively take part in frequent and regular safety committee meetings.

(5) Accident prevention programs shall provide for employer-employee safety meetings and frequent and regular safety inspections of job sites, materials, equipment, and operating procedures.

(6) A record of safety activities, such as inspections and meetings, shall be maintained by the employer for a period covering the previous twelve months and shall be made available, upon request, to noncompliance personnel of the department of labor and industries.

(7) Employees shall individually comply with all safety rules and cooperate with management in carrying out the accident prevention program.

(8) To make effective the preceding statement and promote on-the-job accident prevention, committees shall be established in each port. These committees shall consist of an equal number of port or stevedore company and long-shoremen representatives at the job level with the industry or

company safety supervisor serving as secretary and coordinator. Some functions of the committee are to maintain the interest of the workers in accident prevention by providing for their actual participation in the program, to direct their attention to the real causes of accidents, and to provide a means for making practical use of their intimate knowledge of working conditions and practices.

(9) It is intended that this program will produce mutually practical and effective recommendations regarding correction of accident-producing circumstances and conditions.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60009, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60009, filed 1/17/86; 85-01-022 (Order 84-24), § 296-56-60009, filed 12/11/84.]

WAC 296-56-60062 First-aid kit. (1) All employers who employ men and women covered by the Washington Industrial Safety and Health Act, chapter 49.17 RCW, shall furnish first-aid kits as required by the department of labor and industries, (RCW 51.36.030).

(2) First-aid supplies shall be readily accessible when required.

(3) In the absence of readily accessible first-aid supplies such as first-aid kits, first-aid stations, first-aid rooms or their equivalent, all crew trucks, power shovels, cranes, locomotives, loaders, dozers, logging trucks, speeders, freight trucks, and similar equipment shall be equipped with not less than a ten package first-aid kit.

(4) All crew vehicles used for transporting workmen shall be equipped with not less than a ten package first-aid kit. When more than five employees are being transported on any one trip, the kit shall be increased in size to a 16, 24, or 36-package kit depending upon the number of personnel normally being transported.

(5) At least one first-aid kit shall be available on construction jobs, line crews, and other transient or short duration jobs. The size and quantity of first-aid kits required to be located at any site shall be determined by the number of personnel normally dependent upon each kit as outlined in the following table:

NUMBER OF PERSONNEL NORMALLY ASSIGNED TO WORKSITE	MINIMUM FIRST-AID SUPPLIES REQUIRED AT WORKSITE
1 - 50 PERSONS	FIRST-AID KIT
1 - 5	10 package kit
6 - 15	16 package kit
16 - 30	24 package kit
31 - 50	36 package kit
51 - 200 PERSONS	FIRST-AID STATION
51 - 75	One 36 and one 10 package kit
76 - 100	One 36 and one 16 package kit
101 - 150	One 36 and one 24 package kit
151 - 200	Two 36 package kits
OVER 200 PERSONS	FIRST-AID ROOM Refer to WAC 296-56-60067

(6) Employers shall establish a procedure to assure that first-aid kits and required contents are maintained in a serviceable condition.

(7) First-aid kits shall contain at least the following items:

10 Package Kit

- 1 Pkg. Adhesive bandages, 1" (16 per pkg.)
- 1 Pkg. Bandage compress, 4" (1 per pkg.)
- 1 Pkg. Scissors* and tweezers (1 each per pkg.)
- 1 Pkg. Triangular bandage, 40" (1 per pkg.)
- 1 Pkg. Antiseptic soap or pads (3 per pkg.)
- 5 Pkgs. of consulting physician's choice**

16 Package Kit

- 1 Pkg. Absorbent gauze, 24" x 72" (1 per pkg.)
- 1 Pkg. Adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. Bandage compresses, 4" (1 per pkg.)
- 1 Pkg. Eye dressing (1 per pkg.)
- 1 Pkg. Scissors* and tweezers (1 each per pkg.)
- 2 Pkgs. Triangular bandages, 40" (1 per pkg.)
- 1 Pkg. Antiseptic soap or pads (3 per pkg.)
- 7 Pkgs. of consulting physician's choice**

24 Package Kit

- 2 Pkgs. Absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. Adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. Bandage compresses, 4" (1 per pkg.)
- 1 Pkg. Eye dressing (1 per pkg.)
- 1 Pkg. Scissors* and tweezers (1 each per pkg.)
- 6 Pkgs. Triangular bandages (1 per pkg.)
- 1 Pkg. Antiseptic soap or pads (3 per pkg.)
- 9 Pkgs. of consulting physician's choice**

36 Package Kit

- 4 Pkgs. Absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. Adhesive bandages, 1" (16 per pkg.)
- 5 Pkgs. Bandage compresses, 4" (1 per pkg.)
- 2 Pkgs. Eye dressing (1 per pkg.)
- 1 Pkg. Scissors* and tweezers (1 each per pkg.)
- 8 Pkgs. Triangular bandages, 40" (1 per pkg.)
- 1 Pkg. Antiseptic soap or pads (3 per pkg.)
- 13 Pkgs. of consulting physician's choice**

* Scissors shall be capable of cutting two layers of fifteen ounce cotton cloth or its equivalent.

** First-aid kits shall be maintained at the ten, sixteen, twenty-four or thirty-six package level. In the event the consulting physician chooses not to recommend items, the department of labor and industries shall be contacted for recommended items to complete the kit.

(8) Where the eyes or body of any person may be exposed to injurious chemicals or materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

(9) When practical, a poster shall be fastened and maintained either on or in the cover of each first-aid kit and at or near all phones plainly stating the phone numbers of available doctors, hospitals, and ambulance services within the district of the worksite.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60062, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60062, filed 1/17/86; 85-01-022 (Order 84-24), § 296-56-60062, filed 12/11/84.]

WAC 296-56-60073 Miscellaneous auxiliary gear.

(1) Routine inspection.

(a) At the completion of each use, loose gear such as slings, chains, bridles, blocks, and hooks shall be so placed as to avoid damage to the gear. Loose gear shall be inspected and any defects corrected before re-use.

(b) All loose gear shall be inspected by the employer or his/her authorized representative before each use and, when necessary, at intervals during its use, to ensure that it is safe. Any gear which is found upon inspection to be unsafe shall not be used until it is made safe.

(c) Defective gear shall not be used. Distorted hooks, shackles, or similar gear shall be discarded.

(d) Chains or other gear which have been lengthened, altered, or repaired by welding shall be properly heat treated, and before again being put into use, shall be tested and reexamined in the manner set forth in WAC 296-56-60097 and 296-56-60098.

(2) The employer shall maintain a record of the dates and results of the tests with each unit of gear concerned clearly identified. The records shall be available for examination by division of consultation and compliance personnel and the employee safety committee.

(3) Wire rope and wire rope slings.

(a) The employer shall ascertain and adhere to the manufacturer's recommended ratings for wire rope and wire rope slings and shall have such ratings available at the terminal. When the manufacturer is unable to supply such ratings, the employer shall use the tables for wire rope and wire rope slings found in American National Safety Standard for Slings, ANSI/ASME B30.9-1984. A design safety factor of at least five shall be maintained for the common sizes of running wire used as falls, in purchases or in such uses as light load slings. Wire rope with a safety factor of less than five may be used only:

(i) In specialized equipment, such as cranes designed to be used with lesser wire rope safety factors;

(ii) In accordance with design factors in standing rigging applications; or

(iii) For heavy lifts or other purposes for which a safety factor of five is impractical and for which the employer can demonstrate that equivalent safety is ensured.

(b) Wire rope or wire rope slings exhibiting any of the following conditions shall not be used:

(i) Ten randomly distributed broken wires in one rope lay or three or more broken wires in one strand in one rope lay;

(ii) Kinking, crushing, bird caging, or other damage resulting in distortion of the wire rope structure;

(iii) Evidence of heat damage;

(iv) Excessive wear, corrosion, deformation or other defect in the wire or attachments, including cracks in attachments;

(v) Any indication of strand or wire slippage in end attachments; or

(vi) More than one broken wire in the close vicinity of a socket or swaged fitting.

(c) Four by twenty-nine (4 x 29) wire rope shall not be used in any running rigging.

(d) Protruding ends of strands in splices on slings and bridles shall be covered or blunted. Coverings shall be

removable so that splices can be examined. Means used to cover or blunt ends shall not damage the wire.

(e) Where wire rope clips are used to form eyes, the employer shall adhere to the manufacturer's recommendations, which shall be available at the terminal. If "U" bolt clips are used and the manufacturer's recommendations are not available, Table C-1 shall be used to determine the number and spacing of clips. "U" bolts shall be applied with the "U" section in contact with the dead end of the rope.

Table C-1 — Number and Spacing of U-Bolt Wire Rope Clips

Improved plow steel, rope diameter inches/(cm)	Minimum number of clips		Minimum spacing inches/(cm)
	Drop forged	Other material	
1/2 or less (1.3)	3	4	3 (7.6)
5/8 (1.6)	3	4	3 3/4 (9.5)
3/4 (1.9)	4	5	4 1/2 (11.4)
7/8 (2.2)	4	5	5 1/4 (13.3)
1 (2.5)	5	7	6 (15.2)
1 1/8 (2.7)	6	7	6 3/4 (17.1)
1 1/4 (3.2)	6	8	7 1/2 (18.1)
1 3/8 (3.5)	7	8	8 1/4 (21.0)
1 1/2 (3.8)	7	9	9 (22.9)

(f) Wire rope shall not be secured by knots.

(g) Eyes in wire rope bridles, slings, bull wires, or in single parts used for hoisting shall not be formed by wire rope clips or knots.

(h) Eye splices in wire ropes shall have at least three tucks with a whole strand of the rope and two tucks with one-half of the wire cut from each strand. Other forms of splices or connections which are demonstrated to be equally safe may be used.

(i) Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering, or in bulling cargo, shall consist of one continuous piece without knot or splice.

(4) Natural fiber rope.

(a) The employer shall ascertain the manufacturer's ratings for the specific natural fiber rope used and have such ratings available at the terminal. The manufacturer's ratings shall be adhered to and a minimum design safety factor of five maintained.

(b) Eye splices shall consist of at least three full tucks. Short splices shall consist of at least six full tucks, three on each side of the center line.

(5) Synthetic rope.

(a) The employer shall adhere to the manufacturer's ratings and use recommendations for the specific synthetic fiber rope used and shall have such ratings available at the terminal.

(b) Unless otherwise recommended by the manufacturer, when synthetic fiber ropes are substituted for manila ropes of less than three inches (7.62 cm) circumference, the substitute shall be of equal size. Where substituted for manila rope of three inches or more in circumference, the size of the synthetic rope shall be determined from the formula:

$$C = \sqrt{.6(C_s^2) + .4(C_m^2)}$$

Where C = the required circumference of the synthetic rope in inches, C_s = the circumference to the nearest one-quarter inch of a synthetic rope having a breaking strength not less than that of the size manila rope that would be required by subsection (4) of this section, and C_m = the circumference of manila rope in inches which would be required by subsection

(4) of this section. In making such substitution, it shall be ascertained that the inherent characteristics of the synthetic fiber are suitable for hoisting.

(6) Removal of natural and synthetic rope from service. Natural or synthetic rope having any of the following defects shall be removed from service:

(a) Abnormal wear;
(b) Powdered fiber between strands;
(c) Sufficient cut or broken fibers to affect the capacity of the rope;

(d) Variations in the size or roundness of strands;
(e) Discolorations other than stains not associated with rope damage;

(f) Rotting; or
(g) Distortion or other damage to attached hardware.

(7) Thimbles. Properly fitting thimbles shall be used where any rope is secured permanently to a ring, shackle or attachment, where practical.

(8) Synthetic web slings.

(a) Slings and nets or other combinations of more than one piece of synthetic webbing assembled and used as a single unit (synthetic web slings) shall not be used to hoist loads in excess of the sling's rated capacity.

(b) Synthetic web slings shall be removed from service if they exhibit any of the following defects:

(i) Acid or caustic burns;
(ii) Melting or charring of any part of the sling surface;
(iii) Snags, punctures, tears or cuts;
(iv) Broken or worn stitches; or
(v) Distortion or damage to fittings.

(c) Defective synthetic web slings removed from service shall not be returned to service unless repaired by a sling manufacturer or similar entity. Each repaired sling shall be proof tested by the repairer to twice the slings' rated capacity prior to its return to service. The employer shall retain a certificate of the proof test and make it available for examination.

(d) Synthetic web slings provided by the employer shall only be used in accordance with the manufacturer's recommendations, which shall be made available upon request.

(e) Fittings shall have a breaking strength at least equal to that of the sling to which they are attached and shall be free of sharp edges.

(9) Chains and chain slings used for hoisting.

(a) The employer shall adhere to the manufacturer's recommended ratings for safe working loads for the sizes of the wrought iron and alloy steel chains and chain slings used and shall have such ratings available. When the manufacturer is unable to provide such ratings, the employer shall use the tables for chains and chain slings found in American National Safety Standard for Slings, ANSI B30.9-1971.

(b) Proof coil steel chain, also known as common or hardware chain, and other chain not recommended by the manufacturer for slinging or hoisting shall not be used for slinging or hoisting.

(c)(i) Sling chains, including end fastenings, shall be inspected for visible defects before each day's use and as often as necessary during use to ensure integrity of the sling.

(ii) Thorough inspections of chains in use shall be made quarterly to detect wear, defective welds, deformation, increase in length or stretch. The month of inspection shall

be indicated on each chain by color of paint on a link or by other effective means.

(iii) Chains shall be removed from service when maximum allowable wear, as indicated in Table C-2, is reached at any point of link.

(iv) Chain slings shall be removed from service when stretch has increased the length of a measured section by more than five percent; when a link is bent, twisted or otherwise damaged; or when a link has a raised scarf or defective weld.

(v) Only designated persons shall inspect chains used for slinging and hoisting.

Table C-2 -- Maximum Allowable Wear at Any Point of Link

Chain size		Maximum allowable wear	
Inches		Inches	(cm)
1/4 (9/32)	(0.6)	3/64	(0.1)
3/8	(1.0)	5/64	(0.2)
1/2	(1.3)	7/64	(0.3)
5/8	(1.6)	9/64	(0.4)
3/4	(1.9)	5/32	(0.4)
7/8	(2.2)	11/64	(0.4)
1	(2.5)	3/16	(0.5)
1 1/8	(2.9)	7/32	(0.6)
1 1/4	(3.2)	1/4	(0.6)
1 3/8	(3.5)	9/32	(0.7)
1 1/2	(3.8)	5/16	(0.8)
1 3/4	(4.4)	1 1/32	(0.9)

(d) Chains shall only be repaired under qualified supervision. Links or portions of chain defective under any of the criteria of WAC 296-56-60073 (9)(c) shall be replaced with properly dimensioned links or connections of material similar to that of the original chain. Before repaired chains are returned to service, they shall be tested to the proof test load recommended by the manufacturer for the original chain. Tests shall be performed by the manufacturer or shall be certified by an agency accredited for the purpose under WAC 296-56-60093. Test certificates shall be available at the terminal.

(e) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six months. Heat treatment certificates shall be available at the terminal. Alloy chains shall not be annealed.

(f) Kinked or knotted chains shall not be used for lifting. Chains shall not be shortened by bolting, wiring or knotting. Makeshift links or fasteners such as wire, bolts or rods shall not be used.

(g) Hooks, rings, links and attachments affixed to sling chains shall have rated capacities at least equal to that of the chains to which they are attached.

(h) Chain slings shall bear identification of size, grade and rated capacity.

(10) Shackles.

(a) If available, the manufacturer's recommended safe working loads for shackles shall not be exceeded. In the absence of manufacturer's recommendations, Table C-3 shall apply.

(b) Screw pin shackles used aloft in house fall or other gear, except in cargo hook assemblies, shall have their pins moused or otherwise effectively secured.

Table C-3 -- Safe Working Loads for Shackles

Material size		Pin diameter		Safe working load in 2,000 lb tons
Inches		Inches	(cm)	
1/2	(1.3)	5/8	(1.6)	1.4
5/8	(1.6)	3/4	(1.9)	2.2
3/4	(1.9)	7/8	(2.2)	3.2
7/8	(2.2)	1	(2.5)	4.3
1	(2.5)	1 1/8	(2.9)	5.8
1 1/8	(2.9)	1 1/4	(3.2)	6.7
1 1/4	(3.2)	1 3/8	(3.5)	8.2
1 3/8	(3.5)	1 1/2	(3.8)	10.0
1 1/2	(3.8)	1 3/4	(4.4)	11.9
1 3/4	(4.4)	2	(5.0)	16.2
2	(5.0)	2 1/4	(5.7)	21.2

(c) Tables G-2 through G-5 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope slings with various types of terminals. For sizes, classifications and grades not included in these tables the safe working load recommended by the manufacturer for specific, identifiable products shall be followed, however, a safety factor of not less than five shall be maintained.





TABLE G-1 MANILA ROPE (In pounds or tons of 2,000 pounds)					
Circumferences	Diameter in Inches	Single Leg 	60 Degrees 	45 Degrees 	30 Degrees 
			Lbs.	Lbs.	Lbs.
3/4	1/4	120	204	170	120
1	5/16	200	346	282	200
1 1/8	3/8	270	467	380	270
1 1/4	7/16	350	605	493	350
1 3/8	15/32	450	775	635	450
1 1/2	1/2	530	915	798	530
1 3/4	9/16	690	1190	973	690
2	5/8	880	1520	1240	880
2 1/4	3/4	1080	1870	1520	1080
2 1/2	13/16	1300	2250	1830	1300
2 3/4	7/8	1540	2660	2170	1540
3	1	1800	3120	2540	1800
		Tons	Tons	Tons	Tons
3 1/4	1 1/16	1.0	1.7	1.4	1.0
3 1/2	1 1/8	1.2	2.1	1.7	1.2
3 3/4	1 1/4	1.35	2.3	1.9	1.35
4	1 5/16	1.5	2.6	2.1	1.5
4 1/2	1 1/2	1.8	3.1	2.5	1.8
5	1 5/8	2.25	3.9	3.2	2.25
5 1/2	1 3/4	2.6	4.5	3.7	2.6
6	2	3.1	5.4	4.4	3.1
6 1/2	2 1/8	3.6	6.2	5.1	3.6

TABLE G-2 RATED CAPACITIES FOR IMPROVED FLOW STEEL, INDEPENDENT WIRE ROPE CORE, WIRE ROPE AND WIRE SLINGS (IN TONS OF 2,000 POUNDS)

Rope Diameter Inches	Single Leg					
	Vertical			Choker		
	A	B	C	A	B	C
6 x 19 Classification						
1/4"	.59	.56	.53	.44	.42	.40
3/8"	1.3	1.1	1.1	.98	.93	.86
1/2"	2.3	2.2	2.0	1.7	1.6	1.5
5/8"	3.6	3.4	3.0	2.7	2.5	2.2
3/4"	5.1	4.9	4.2	3.8	3.6	3.1
7/8"	6.9	6.6	5.5	5.2	4.9	4.1
1"	9.0	8.5	7.2	6.7	6.4	5.4
1-1/8"	11	10	9.0	8.5	7.8	6.8
6 x 37 Classification						
1-1/4"	13	12	10	9.9	9.2	7.9
1-3/8"	16	15	13	12	11	9.6
1-1/2"	19	17	15	14	13	11
1-3/4"	26	24	20	19	18	15
2"	33	30	26	25	23	20
2-1/4"	41	38	33	31	29	25

(A) -- Socket or Swaged Terminal attachment.
(B) -- Mechanical Sleeve attachment.
(C) -- Hand Tucked Splice attachment.

TABLE G-4 RATED CAPACITIES FOR IMPROVED FLOW STEEL, FIBER CORE, WIRE ROPE AND WIRE ROPE SLINGS (In Tons of 2,000 pounds)

Rope dia. Inches	Single leg					
	Vertical			Choker		
	A	B	C	A	B	C
6 x 19 Classification						
1/4	.55	.51	.49	.41	.38	.37
3/8	1.2	1.1	1.1	.91	.85	.80
1/2	2.1	2.0	1.8	1.6	1.5	1.4
5/8	3.3	3.1	2.8	2.5	2.3	2.1
3/4	4.8	4.4	3.9	3.6	3.3	2.9
7/8	6.4	5.9	5.1	4.8	4.5	3.9
1	8.4	7.7	6.7	6.3	5.8	5.0
1-1/8	10	9.5	8.4	7.9	7.1	6.3
6 x 37 Classification						
1-1/4	12	11	9.8	9.2	8.3	7.4
1-3/8	15	13	12	11	10	8.9
1-1/2	17	16	14	13	12	10
1-3/4	24	21	19	18	16	14
2	31	28	25	23	21	18

(A) -- Socket or Swaged Terminal attachment.
(B) -- Mechanical Sleeve attachment.
(C) -- Hand Tucked Splice attachment.

TABLE G-3 RATED CAPACITIES FOR IMPROVED FLOW STEEL, INDEPENDENT WIRE ROPE CORE, WIRE ROPE SLINGS (IN TONS OF 2,000 POUNDS)

Rope dia. Inches	Two-leg bridle or basket hitch											
	Vertical			60 degree			45 degree			30 degree		
	A	B	C	A	B	C	A	B	C	A	B	C
6 x 19 Classification												
1/4"	1.2	1.1	1.0	1.0	.97	.92	.83	.79	.75	.59	.56	.53
3/8"	2.6	2.5	2.3	2.3	2.1	2.0	1.8	1.8	1.6	1.3	1.2	1.1
1/2"	4.6	4.4	3.9	4.0	3.8	3.4	3.2	3.1	2.8	2.3	2.2	2.0
5/8"	7.2	6.8	6.0	6.2	5.9	5.2	5.1	4.8	4.2	3.6	3.4	3.0
3/4"	10	9.7	8.4	8.9	8.4	7.3	7.2	6.9	5.9	5.1	4.9	4.2
7/8"	14	13	11	12	11	9.6	9.8	9.3	7.8	6.9	6.6	5.5
1"	18	17	14	15	15	12	13	12	10	9.0	8.5	7.2
1-1/8"	23	21	18	19	18	16	16	15	13	11	10	9.0
6 x 37 Classification												
1-1/4"	26	24	21	23	21	18	19	17	15	13	12	10
1-3/8"	32	29	25	28	25	22	22	21	18	16	15	13
1-1/2"	38	35	30	33	30	26	27	25	21	19	17	15
1-3/4"	51	47	41	44	41	35	36	33	29	26	24	20
2"	66	61	53	57	53	46	47	43	37	33	30	26
2-1/4"	83	76	66	72	66	57	58	54	47	41	38	33

(A) -- Socket or Swaged Terminal Attachment.
(B) -- Mechanical Sleeve Attachment.
(C) -- Hand Tucked Splice Attachment.

TABLE G-5 RATED CAPACITIES FOR IMPROVED FLOW STEEL, FIBER CORE, WIRE ROPE SLINGS (In Tons of 2,000 Pounds)

Rope dia. Inches	Two-leg bridle or basket hitch											
	Vertical			60 Degree			45 Degree			30 degree		
	A	B	C	A	B	C	A	B	C	A	B	C
6 x 19 Classification												
1/4	1.1	1.0	.99	.95	.88	.85	.77	.72	.70	.55	.51	.49
3/8	2.4	2.2	2.1	2.1	1.9	1.8	1.7	1.6	1.5	1.2	1.1	1.1
1/2	4.3	3.9	3.7	3.7	3.4	3.2	3.0	2.8	2.6	2.1	2.0	1.8
5/8	6.7	6.2	5.6	5.8	5.3	4.8	4.7	4.4	4.0	3.3	3.1	2.8
3/4	9.5	8.8	7.8	8.2	7.6	6.8	6.7	6.2	5.5	4.8	4.4	3.9
7/8	13	12	10	11	10	8.9	9.1	8.4	7.3	6.4	5.9	5.1
1	17	15	13	14	13	11	12	11	9.4	8.4	7.7	6.7
1-1/2	21	19	17	18	16	14	15	13	12	10	9.5	8.4
6 x 37 Classification												
1-1/4	25	22	20	21	19	17	17	16	14	12	11	9.8
1-3/8	30	27	24	26	23	20	21	19	17	15	13	12
1-1/2	35	32	28	30	27	24	25	22	20	17	16	14
1-3/4	48	43	38	41	37	33	34	30	27	24	21	19
2	62	55	49	53	48	43	43	39	35	31	28	25

(A) -- Socket or Swaged Terminal attachment.
(B) -- Mechanical Sleeve attachment.
(C) -- Hand Tucked Splice attachment.

TABLE G-6 ALLOY STEEL CHAIN (In Tons of 2,000 Pounds)

Nominal size chain stock Inch.	Single leg	60 degree	45 degree	30 degree
1/4	1.62	2.82	2.27	1.62
3/8	3.30	5.70	4.65	3.30
1/2	5.62	9.75	7.90	5.62
5/8	8.25	14.25	11.65	8.25
3/4	11.5	19.9	16.2	11.5
7/8	14.3	24.9	20.3	14.3
1	19.3	33.5	27.3	19.8
1-1/8	22.2	38.5	31.5	22.2
1-1/4	28.7	49.7	40.5	28.7
1-3/8	33.5	58.0	47.0	33.5
1-1/2	39.7	68.5	56.0	39.7
1-5/8	42.5	73.5	59.5	42.5
1-3/4	47.0	81.5	62.0	47.0

(11) Hooks other than hand hooks.

(a) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

(b) Loads shall be applied to the throat of the hook since loading the point may overstress, bend, or spring the hook.

(c) Hooks shall be inspected once a month to see that they have not been bent by overloading. Bent or sprung hooks shall not be used.

(d) Crane hooks. Magnetic particle or other suitable crack detecting inspection shall be performed at least once each year. When testing by x-ray, the pertinent provisions of the Nuclear Regulatory Commission's standards for protection against radiation, relating to protection against occupational radiation exposure, shall apply.

(e) Any activity which involves the use of radioactive materials or x-rays, whether or not under license from the Nuclear Regulatory Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment. In the case of materials used under commission license, only persons actually licensed, or competent persons under direction and supervision of the licensee, shall perform such work.

(f) Teeth of case hooks shall not be split, cracked, or deformed.

(g) Jaws of patent clamp type plate hooks shall be kept in safe condition so that they will grip plates securely.

(12) Pallets.

(a) Pallets shall be made and maintained to safely support and carry loads being handled. Fastenings of reusable pallets used for hoisting shall be bolts and nuts, drive screws (helically threaded nails), annular threaded nails or fastenings of equivalent holding strength.

(b) Damaged pallets shall be stored in designated areas and identified.

(c) Reusable wing or lip-type pallets shall be hoisted by bar bridles or other suitable gear and shall have an overhanging wing or lip of at least three inches (76.2 mm). They shall not be hoisted by wire slings alone.

(d) Loaded pallets that do not meet the requirements of this paragraph shall be hoisted only after being placed on pallets meeting such requirements or shall be handled by other means providing equivalent protection.

(e) Bridles for handling flush end or box-type pallets shall be designed to prevent disengagement from the pallet under load.

(f) Pallets shall be stacked or placed to prevent falling, collapsing or otherwise causing a hazard under standard operating conditions.

(g) Disposable pallets intended only for one use shall not be re-used for hoisting.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60073, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-56-60073, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-56-60073, filed

5/20/91, effective 6/20/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60073, filed 1/17/86; 85-10-004 (Order 85-09), § 296-56-60073, filed 4/19/85; 85-01-022 (Order 84-24), § 296-56-60073, filed 12/11/84.]

WAC 296-56-60083 Cranes and derricks. (1) Scope.

(a) This section applies to every kind of crane and derrick and to any other type of equipment performing the functions of a crane or derrick except as noted in (b) of this subsection.

(b) This section does not apply to small industrial truck-type cranes, container handling toploaders and sideloaders, chain hoists, and mobile straddle-type cranes incapable of straddling two or more intermodal containers (sixteen feet (4.88 m) in width).

(2) Ratings.

(a) Except for bridge cranes covered by subsection (7) of this section, cranes and derricks having ratings that vary with boom length, radius (outreach) or other variables shall have a durable rating chart visible to the operator, covering the complete range of the manufacturer's (or design) capacity ratings. The rating chart shall include all operating radii (outreach) for all permissible boom lengths and jib lengths as applicable, with and without outriggers, and alternate ratings for optional equipment affecting such ratings. Precautions or warnings specified by the owner or manufacturer shall be included.

(b) The manufacturer's (or design) rated loads for the conditions of use shall not be exceeded.

(c) Designated working loads shall not be increased beyond the manufacturer's ratings or original design limitations unless such increase receives the manufacturer's approval. When the manufacturer's services are not available or where the equipment is of foreign manufacture, engineering design analysis shall be performed or approved by a person accredited for certifying the equipment under WAC 296-56-60093. Cranes shall conform with the manufacturer's specifications or any current ANSI standards that apply. Engineering design analysis shall be performed by a registered professional engineer competent in the field of cranes and derricks. Any structural changes necessitated by the change in rating shall be carried out.

(3) Radius indicator. When the rated load varies with the boom radius, the crane or derrick shall be fitted with a boom angle or radius indicator visible to the operator.

(4) Prohibited usage.

(a) Equipment shall not be used in a manner that exerts sideloading stresses upon the crane or derrick boom.

(b) No crane or derrick having a visible or known defect that affects safe operation shall be used.

(5) Protective devices.

(a) When exposed moving parts such as gears, chains and chain sprockets present a hazard to employees during crane and derrick operations, those parts shall be securely guarded.

(b) Crane hooks shall be latched or otherwise secured to prevent accidental load disengagement.

(c) When hoisting personnel in an approved man basket, the hook shall have a positive safety latch to prevent roll-overs.

(6) General.

(a) Operating controls.

(i) Crane and derrick operating controls shall be clearly marked, or a chart indicating their function shall be posted at the operator's position.

(ii) All crane controls shall operate in a uniform manner within a given port.

(iii) Overhead bridge and container gantry crane operating control levers shall be self-centering so that they will automatically move to the "off" position when the operator releases the control.

(b) Booms. Cranes with elevatable booms and without operable automatic limiting devices shall be provided with boom stops if boom elevation can exceed maximum design angles from the horizontal.

(c) Foot pedals. Foot pedals shall have a nonskid surface.

(d) Access. Ladders, stairways, stanchions, grab irons, foot steps or equivalent means shall be provided as necessary to ensure safe access to footwalks, cab platforms, the cab and any portion of the superstructure which employees must reach.

(i) Footwalks shall be of rigid construction, and shall be capable of supporting a load of one hundred pounds (4.79 kPa) per square foot.

(ii) If more than twenty feet (6.1 m) in height, vertical ladders shall comply with WAC 296-56-60209 (4), (5)(a), (5)(b)(iii) and (5)(b)(iv).

(iii) Stairways on cranes shall be equipped with rigid handrails meeting the requirements of WAC 296-56-60123 (5)(a).

(iv) If the top of a ladder or stairway or any position thereof is located where a moving part of a crane, such as a revolving house, could strike an employee ascending or descending the ladder or stairway, a prominent warning sign shall be posted at the foot of the ladder or stairway. A system of communication (such as a buzzer or bell) shall be established and maintained between the foot of the ladder or stairway and the operator's cab.

(e) Operator's station. The cab, controls, and mechanism of the equipment shall be so arranged that the operator has a clear view of the load or signal person, when one is used. Cab glass, when used, shall be safety plate glass or equivalent and good visibility shall be maintained through the glass. Clothing, tools and equipment shall be stored so as not to interfere with access, operation, or the operator's view.

(f) Counterweights or ballast. Cranes shall be operated only with the specified type and amount of ballast or counterweights. Ballast or counterweight shall be located and secured only as provided in the manufacturer's or design specifications, which shall be available.

(g) Outriggers. Outriggers shall be used according to the manufacturer's specifications or design data, which shall be available. Floats, when used, shall be securely attached to the outriggers. Wood blocks or other support shall be of sufficient size to support the outrigger, free of defects that may affect safety and of sufficient width and length to prevent the crane from shifting or toppling under load.

(h) Exhaust gases. Engine exhaust gases shall be discharged away from the normal position of crane operating personnel.

(i) Electrical equipment shall be so located or enclosed that live parts will not be exposed to accidental contact. Designated persons may work on energized equipment only if necessary during inspection, maintenance, or repair.

(j) Fire extinguisher.

(i) At least one portable fire extinguisher of at least 5-BC rating or equivalent shall be accessible in the cab of the crane or derrick.

(ii) No portable fire extinguisher using carbon tetrachloride or chlorobromomethane extinguishing agents shall be used.

(k) Rope on drums. At least three full turns of rope shall remain on ungrooved drums, and two turns on grooved drums, under all operating conditions. Wire rope shall be secured to drums by clamps, U-bolts, shackles, or equivalent means. Fiber rope fastenings are prohibited.

(l) Assembly or disassembly of boom sections. Mobile crane booms being assembled or disassembled on the ground with or without the support of the boom harness shall be blocked to prevent dropping of the boom or boom sections.

(m) Brakes.

(i) Each independent hoisting unit of a crane shall be equipped with at least one holding brake, applied directly to the motor shaft or gear train.

(ii) Each independent hoisting unit of a crane, except worm geared hoists, the angle of whose worm is such as to prevent the load from accelerating in the lowering direction, shall, in addition to a holding brake, be equipped with a controlled braking means to control lowering speeds.

(iii) Holding brakes for hoist units shall have not less than the following percentage of the rated load hoisting torque at the point where the brake is applied:

(A) One hundred twenty-five percent when used with a controlled braking means.

(B) One hundred percent when used with a mechanically-controlled braking means.

(C) One hundred percent when two holding brakes are provided.

(iv) All power control braking means shall be capable of maintaining safe lowering speeds of rated loads.

(n) Each crane or derrick shall be equipped with sufficient lights to maintain five foot candles in the working area around the load hook. All crane ladders and machinery houses shall be illuminated at a minimum of two candle power.

(o) Light fixtures connected to the boom, gantry legs, or machinery house shall be provided with safety devices which will prevent the light fixture from falling in case of bracket failure.

(p) Electronic devices may be installed to prevent collision subject to approval of the accredited certification agency.

(q) On all rail gantry cranes, truck guards shall extend on the ends of the trucks, close to the top of the rail to prevent worker's feet from being caught between the rail and wheel. This subsection does not apply if rail sweeps are present.

(r) All hydraulic cylinders used to control crane booms or to provide crane stability (outriggers) shall be equipped with a pilot operated check valve or a device which will

prevent the boom or outrigger from retracting in case of failure of a component of the hydraulic system.

(s) Gantry cranes shall be provided with automatic rail clamps or other devices to prevent the crane from moving when not being used or when power is off.

(7) Rail-mounted cranes (excluding locomotive types).

(a) For the purposes of this section, rail-mounted cranes include bridge cranes and portal cranes.

(b) Rated load marking. The rated loads of bridge cranes shall be plainly marked on each side of the crane and in the cab. If there is more than one hoisting unit, each hoist shall have its rated load marked on it or on its load block. Marking shall be legible from the ground level.

(c) Wind-indicating devices.

(i) Each rail-mounted bridge and portal crane located outside of an enclosed structure shall be fitted with an operable wind-indicating device.

(ii) The wind indicating device shall provide a visible or audible warning to alert the operator of high wind conditions. That warning shall be transmitted whenever the following circumstances are present:

(A) When wind velocity reaches the warning speed, not exceeding the crane manufacturer's recommendations; and

(B) When wind velocity reaches the shutdown speed, not exceeding the crane manufacturer's recommendations, at which work is to be stopped and the crane secured.

(iii) Instructions. The employer shall post operating instructions for high wind conditions in the operator's cab of each crane. Operators shall be directed to comply with these instructions. The instructions shall include procedures for responding to high wind alerts and for any coordination necessary with other cranes.

(d) Securing of cranes in high winds.

(i) When the wind reaches the crane's warning speed:

(A) Gantry travel shall be stopped; and

(B) The crane shall be readied for shutdown.

(ii) When the wind reaches the crane's shutdown speed:

(A) Any portion of the crane spanning or partially spanning a vessel shall be moved clear of the vessel if safe to do so; and

(B) The crane shall be secured against travel, using all available means of securing.

(e) The employer shall monitor local weather conditions by subscribing to a weather service or using equally effective means.

(f) Stops and bumpers.

(i) The ends of all tracks shall be equipped with stops or bumpers. If a stop engages the tread of the wheel, it shall be of a height not less than the radius of the wheel.

(ii) When more than one crane operates on the same runway or more than one trolley on the same bridge, each crane or trolley shall be equipped with bumpers or equivalent devices at adjacent ends subject to impact.

(g) Employee exposure to crane movement. When employees may be in the vicinity of the tracks, crane trucks shall be equipped with personnel-deflecting guards.

(h) Pedestrian clearance. If the track area is used for employee passage or for work, a minimum clearance of three feet (0.9 m) shall be provided between trucks or the structures of rail-mounted cranes and any other structure or obstruction. When the required clearance is not available on

at least one side of the crane's trucks, the area shall not be used and shall be marked and identified.

(i) Warning devices. Rail-mounted cranes shall be equipped with an effective audible and visible travel warning device which shall be used to warn employees who may be in the path of the moving crane.

(j) Communications.

(i) Means of communication shall be provided between the operator's cab and the base of the gantry of all rail-mounted cranes. This requirement may be met by telephone, radio, sound-signaling system or other effective methods, but not solely by hand-signaling.

(ii) All rail-mounted cranes thirty ton and above capacity shall be equipped with a voice hailing device (PA system) from the operator to the ground, audible within one hundred feet.

(k) Cranes and crane operations—Scope and application. The sections of this chapter, WAC 296-56-60083 through 296-56-60099, apply to cranes and crane operations.

(l) Signal persons. A signal person shall be required when a crane operator's visibility is obstructed. When a signal person is required to transmit hand signals, they shall be in such a position that the operator can plainly see the signals.

(m) Signals. All operators and signal persons shall use standard signals as illustrated for longshore crane operations. (See Appendices C and D, at the end of this chapter.)

(n) Signal person for power units. Where power units, such as cranes and winches are utilized and signaling is required, the operator shall be instructed as to who is authorized to give signals. The operator shall take signals only from such authorized person. In case of emergency, any worker shall be authorized to give a stop signal.

(i) No draft shall be hoisted unless the winch or crane operator can clearly see the draft itself or see the signals of any signal person associated with the operation.

(ii) Loads requiring continuous manual guidance while in motion shall be provided with tag lines.

(o) Landing loads. Persons assisting in landing a load shall face the load and use caution to prevent themselves from getting in a position where they may be caught between the load and a fixed object.

(8) Stabilizing of locomotive cranes. Loads may be hoisted by locomotive cranes only if outriggers are in place, unless means are taken to prevent the load being carried by the truck springs of the crane.

(9) Operations.

(a) Use of cranes together. When two or more cranes hoist a load in unison, a designated person shall direct the operation and instruct personnel in positioning, rigging of the load and movements to be made.

(b) Guarding of swing radius. Accessible areas within the swing radius of the body of a revolving crane shall be physically guarded during operations to prevent an employee from being caught between the body of the crane and any fixed structure or between parts of the crane.

(c) Securing mobile crane components in transit. The crane's superstructure and boom shall be secured against rotation and carried in line with the direction of travel except when negotiating turns with an operator in the cab or when the boom is supported on a dolly. The empty hook or other attachment shall be secured.

(d) Unattended cranes. The following steps shall be taken before leaving a crane unattended between work periods:

(i) Suspended loads, such as those hoisted by lifting magnets or clamshell buckets, shall be landed unless the storage position or maximum hoisting of the suspended device will provide equivalent safety;

(ii) Clutches shall be disengaged;

(iii) The power supply shall be shut off;

(iv) The crane shall be secured against accidental travel; and

(v) The boom shall be lowered or secured against movement.

(e) Operating near electric power lines.

(i) Clearance. Unless electrical distribution and transmission lines are deenergized and visibly grounded at point of work, or unless insulating barriers not a part of or an attachment to the crane have been erected to prevent physical contact with lines, cranes may be operated near power lines only in accordance with following:

(A) For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be ten feet (3 m);

(B) For lines rated over 50 kV, minimum clearance between the lines and any part of the crane or load shall be either 10 feet (3 m) plus 0.4 inch (10 mm) for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than ten feet; and

(C) In transit with no load and boom lowered, the clearance shall be a minimum of four feet (1.2 m).

(ii) Boom guards. Cage-type boom guards, insulating links or proximity warning devices may be used on cranes, but they shall not be used in place of the clearances required by subsection (9)(e)(i) of this section.

(iii) Determination of energized lines. Any overhead line shall be presumed to be energized until the owner of the line indicates that it is not energized.

(10) Protection for employees being hoisted.

(a) No employee shall be hoisted by the load hoisting apparatus of a crane or derrick except:

(i) On intermodal container spreaders, equipped in accordance with this subsection; or

(ii) In a boatswain's chair or other device rigged to prevent it from accidental disengagement from the hook or supporting member; or

(iii) On a platform meeting the following requirements:

(A) Enclosed by a railing or other means providing protection equivalent to that described in WAC 296-56-60123(3). If equipped with open railings, the platform shall be fitted with toe boards;

(B) Having a safety factor of four based on ultimate strength;

(C) Bearing a plate or permanent marking indicating maximum load rating, which shall not be exceeded, and the weight of the platform itself;

(D) Equipped with a device to prevent access doors, when used, from opening accidentally;

(E) Equipped with overhead protection for employees on the platform if they are exposed to falling objects or overhead hazards;

(F) Secured to the load line by means other than wedge and socket attachments, unless the free (bitter) end of the line is secured back to itself by a clamp placed as close above the wedge as possible.

(b) Except in an emergency, the hoisting mechanism of all overhead and container gantry cranes used to hoist personnel shall operate in power up and power down, with automatic brake application when not hoisting or lowering.

(c) Variable radius booms of a crane or derrick used to hoist personnel shall be so constructed or secured as to prevent accidental boom movement.

(d) Platforms or devices used to hoist employees shall be inspected for defects before each day's use and shall be removed from service if defective.

(e) Employees being hoisted shall remain in continuous sight of and communication with the operator or signal person.

(f) Operators shall remain at the controls when employees are hoisted.

(g) Cranes shall not travel while employees are hoisted, except in emergency or in normal tier to tier transfer of employees during container operations.

(h) When intermodal container spreaders are used to transfer employees to or from the tops of containers, the spreaders shall be equipped with a personnel platform equipped with fixed railings, provided that the railings have one or more openings for access. The openings shall be fitted with a means of closure, such as chains with hooks. Existing railings shall be at least thirty-six inches (0.91 m) in height. New railings installed after October 3, 1983 shall be forty-two inches (1.07 m), plus or minus three inches (7.6 cm), in height. The provisions of (a)(iii)(C), (D), and (F) of this subsection also apply to personnel platforms when container spreaders are used.

(i) Positive safety latch-type hooks or moused hooks shall be used.

(11) Routine inspection.

(a) Designated persons shall visually inspect each crane and derrick on each day of use for defects in functional operating components and shall report any defect found to the employer. The employer shall inform the operator of the findings.

(b) A designated person shall thoroughly inspect all functional components and accessible structural features of each crane or device at monthly intervals.

(c) Any defects found during such inspections which may create a safety hazard shall be corrected before further use. Repairs shall be performed only by designated persons.

(d) A record of monthly inspections shall be maintained for six months in or on the crane or derrick or at the terminal.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60083, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-56-60083, filed 10/30/92, effective 12/8/92. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60083, filed 1/17/86; 85-10-004 (Order 85-09), § 296-56-60083, filed 4/19/85; 85-01-022 (Order 84-24), § 296-56-60083, filed 12/11/84.]

WAC 296-56-60093 Certification of marine terminal material handling devices. (1) The employer shall not use any material handling device listed in WAC 296-56-

60098(8) until he/she has ascertained that the device has been certified, as evidenced by current and valid documents attesting to compliance with the requirements of WAC 296-56-60097 and 296-56-60098.

(2) Certification surveys are to be completed for the conditions of use found at the time such surveys are performed. Equipment owners or users may change the configurations of the equipment according to the manufacturer's specifications without affecting the established certification status for the equipment.

(3) These rules apply to employment within a marine terminal including the loading, unloading, movement, or other handling of cargo, ship's stores, or gear within the terminal or into or out of any land carrier, holding or consolidation area, or any other activity within and associated with the overall operation and functions of the terminal, such as the use and routine maintenance of facilities and equipment.

(4) Inspection and test certificates shall be issued only for that equipment which meets or exceeds the requirements specified in these rules. All inspection and test certificates shall be issued through the office of the assistant director of the division of consultation and compliance, department of labor and industries, and shall be valid for a period not to exceed one year from the date of issuance.

(5) Equipment requiring certification shall be inspected by representatives of the division of consultation and compliance; or individuals who have received a "certificate of competency" from the assistant director, division of consultation and compliance indicating that they are qualified and capable of performing such work.

(6) When deficiencies are found they shall be noted on forms provided for such purpose by the division of consultation and compliance. Copies shall be delivered to the owner of the equipment and the division of consultation and compliance at the headquarter's office by the person conducting such tests or inspections.

(7) A certificate of unit test or examination of equipment shall not be issued for any equipment found not to be in compliance with the provisions of this chapter.

(8) Persons desiring a "certificate of competency" shall demonstrate and document their capabilities and qualifications to the assistant director of the division of consultation and compliance, who will issue certificates to those persons who have demonstrated competency. The assistant director reserves the right to revoke such certificates at any time for cause. A "certificate of competency" shall be issued for a period of not more than three years. Applications for renewal may be made not more than sixty days prior to the expiration date shown on the certificate.

(9) The assistant director of the division of consultation and compliance or his/her representative, reserves the right to inspect such equipment or to witness or attend any test or inspection in order to ascertain the adequacy of any certification activity performed.

(10) Unless otherwise exempted, all cranes or derricks required to be certificated by these regulations shall have a current test certificate posted in the operator's cab or station. No person shall operate such crane or derrick unless a current valid certificate is posted.

49.17.050. 86-03-064 (Order 86-02), § 296-56-60093, filed 1/17/86; 85-10-004 (Order 85-09), § 296-56-60093, filed 4/19/85; 85-01-022 (Order 84-24), § 296-56-60093, filed 12/11/84.]

WAC 296-56-60095 Advisory crane certification panel. (1) Any person desiring a certificate of competency for crane inspection or certification shall make application to the assistant director of the division of consultation and compliance for the certificate of competency. The application shall include documentation of all qualifications, including all past experience, education, training and any other factors deemed to be relevant to the application.

(2) The advisory crane certification panel shall assist the assistant director of the division of consultation and compliance in his/her duties under this chapter. The panel shall consist of six members. Two members shall represent labor, two members shall represent management, and one member shall be a crane expert. The sixth member shall be chair of the panel. He/she shall be the assistant director of consultation and compliance or his/her designee. The panel shall be responsible for advising the assistant director as to the issuance of any certificate of competency. The panel shall review all applications for certificates of competency. Minutes of meetings shall be kept.

(3) In addition, the panel shall, upon request by the assistant director, render advice concerning any matter which is relevant to crane safety. The panel shall meet twice yearly or more often as deemed necessary by the chairman of the panel. Any panel member who is not an employee of the state of Washington shall serve voluntarily.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60095, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60095, filed 1/17/86; 85-01-022 (Order 84-24), § 296-56-60095, filed 12/11/84.]

WAC 296-56-60097 Unit proof load test and inspection. Cranes and derricks shall be proof load tested, rated and certified in tons (2,000 lbs. = 1 ton). Cranes and derricks shall be inspected and unit proof load tested prior to being put into use, after any significant modification or repairs of structural parts, or when deemed necessary by the assistant director of consultation and compliance or his/her designee. However, each crane or derrick shall be unit proof load tested at least once during each twelve-month period. Unit proof load tests shall be carried out by the use of weights as a dead load. When use of weights for unit proof load tests is not possible or reasonable a dynamometer or other recording test equipment may be used. Such equipment shall be tested for accuracy with certified calibrating equipment within twelve months prior to being used and a copy of the certified calibration test shall be made available to authorized representatives of the division of consultation and compliance upon request.

The weight of the objects used for a dead load weight test shall be certified and a record of the weight shall be made available upon request. Any replacements or repairs deemed necessary by the person conducting a test shall be carried out before application of the required proof load unit test.

(1) The proof load tests for derricks shall be conducted as follows:

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60093, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and

Safe Working Load	Proof Load
to 20 tons	25% in excess
20-50 tons	5 tons in excess
over 50 tons	10% in excess of manufacturer's recommended lifting capacity.

Proof load shall be applied at the designed maximum and minimum boom angles or radii, or if this is impractical, as close to these as practical. The angles or radii of test shall be stated in the certificate of test. Proof loads shall be swung as far as possible in all directions. The weight of auxiliary handling devices such as spreader bars, robots, clams, magnets, or other gear shall be considered a part of the load. Brakes shall be tested by holding the proof load suspended without other mechanical assistance. After satisfactory completion of a unit proof load test the derrick and all component parts thereof shall be carefully examined and nondestructive tests may be conducted to assure that the equipment is safe for use and has not been damaged in the unit proof load testing process.

(2) Unit proof load tests for cranes shall be carried out with the boom in the least stable direction relative to the mounting, based on the manufacturer's specifications.

Unit proof load tests for cranes shall be based on the manufacturer's load ratings for the conditions of use and shall, except in the case of bridge type cranes utilizing a trolley, consist of application of a proof load of ten percent in excess of the load ratings at maximum and minimum radius, and at such intermediate radii as the certifying authority may deem necessary in the circumstances. (The manufacturer's load ratings are usually based upon percentage of tipping loads under some conditions and upon limitations of structural competence at others, as well as on other criteria such as type of crane mounting, whether or not outriggers are used, etc. Some cranes utilizing a trolley may have only one load rating assigned and applicable at any outreach. It is important that the manufacturer's ratings be used.) Trolley equipped cranes shall be subject to a proof load of twenty-five percent in excess of the manufacturer's load rating. In cases of foreign manufacture, the manufacturer's specifications shall be subject to approval by the certifying authority. The weight of all auxiliary handling devices such as magnets, hooks, slings, and clamshell buckets shall be considered part of the load.

(3) In the event neither manufacturer's data nor design data on safe working loads (including any applicable limitations) are obtainable, the safe working load ratings assigned shall be based on the owner's information and warranty that those so assigned are correct. Unit test certificates shall state the basis for any safe working load assignment.

(4) If the operation in which equipment is engaged never utilizes more than a fraction of the safe working load rating, the owner of the equipment may, at his/her option, have the crane or derrick certified for and operated at a lesser maximum safe working load in keeping with the use and based on radius and other pertinent factors, however, the equipment concerned shall be physically capable of operation at the original load rating and the load reduction shall not be for the purpose of avoiding correction of any deficiency.

(5) Safe working load ratings shall not be increased beyond the manufacturer's ratings or original design limitations without prior approval by the accredited certification agency. Such prior approval shall be based on the manufacturer's approval of such increase or documented engineering design analysis or both. All necessary structural changes shall be completed prior to approval by the accredited certification agency.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60097, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60097, filed 1/17/86; 85-01-022 (Order 84-24), § 296-56-60097, filed 12/11/84.]

WAC 296-56-60098 Examination and inspection of cranes and derricks. (1) An examination shall be carried out in conjunction with each annual unit proof load test. The accredited person, or their authorized representative, shall make a determination as to correction of deficiencies found. The examination shall include the following: (Refer to WAC 296-56-60093(8) for definition of accredited person.)

(a) All functional operating mechanisms shall be examined for improper function, maladjustment, and excessive component wear, with particular attention to sheaves, pins, and drums. The examinations shall include operation with partial load, in which all functions and movements, including maximum possible rotation in both directions, are checked.

(b) All safety devices shall be examined for malfunction.

(c) Lines, tanks, valves, drains, pumps, and other parts of air or hydraulic systems shall be examined for deterioration or leakage.

(d) Rope reeving shall comply with the manufacturer's recommendations.

(e) Deformed, cracked, or excessively corroded members in crane structure and boom shall be repaired or replaced as necessary.

(f) Loose bolts, rivets, or other connections shall be corrected.

(g) Worn, cracked, or distorted parts affecting safe operation shall be corrected.

(h) All brakes, used to control the load, boom or travel of the crane, shall be tested. Air, hydraulic, or electrically operated brakes shall be of such design as to set and stop the load if the source of power fails.

(i) Brake and clutch system parts, linings, pawls, and ratchets shall be examined for excessive wear and free operation.

(j) Load, boom angle, or other indicators shall be checked over their full range. Defects in such indicators shall be immediately corrected.

(k) Where used, clamshell buckets or other similar equipment, such as magnets, shall be carefully examined in all respects, with particular attention to closing line wires and sheaves. The accredited person may supplement such examination by requesting any operational tests deemed appropriate.

(l) Careful examination of the junction areas of removable boom sections, particularly for proper seating, cracks,

deformities, or other defects in securing bolts and in the vicinity of such bolts, shall be made.

(m) All platforms, steps and footwalks located on cranes where workers are exposed to the hazard of slipping shall be of a nonslip material. Wire rope used for railings on cranes shall be kept taut at all times.

Note: In critical areas such as footwalks along booms, a grating material should be used.

(n) No counterweights in excess weight of the manufacturer's specifications shall be fitted or used.

(o) Such other examination or supplemental functional tests shall be made as may be deemed necessary by the accredited person under the circumstances.

(2) Wire rope.

(a) All wire rope shall be inspected at least once a month, dependent upon conditions to which the wire ropes are subjected, and at intervals not exceeding a twelve-month period. Records of inspection of wire rope shall be kept and shall be available to the department of labor and industries representative. Records shall be kept for one year. Refer to the general safety and health standards, WAC 296-24-24013.

(b) Wire rope shall not be used if in any length of eight diameters, the total number of visible broken wires exceeds ten percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect. Particular attention shall be given to the condition of those sections of wire rope adjacent to any terminal connections, those sections exposed to abnormal wear, and those sections not normally exposed for examination.

(c) Documentation available for inspection shall include wire rope test certificates relating to any replacements made since the last unit test or annual examination as required.

(d) Wire rope and replacement wire rope shall be of the same size, same or better grade, and same construction as originally furnished by the equipment manufacturer or contemplated in the design, unless otherwise recommended by the equipment or wire rope manufacturer due to actual working conditions. In the absence of specific requirements, wire rope shall be of a size and construction suitable for the purpose, and shall have the capacity to handle four times the heaviest expected load, verified by wire rope test certificate.

(e) Wire rope in use on equipment previously constructed and prior to initial certification of said equipment shall not be required to be tested but shall be subject to thorough examination at the time of initial certification of the equipment.

(3)(a) Accessory components. Container spreader bar twist locks shall be carefully examined periodically and at the time of annual examination and inspection. Cracked or deformed hooks shall be discarded immediately and not reused.

(b) Crane hooks and container spreader bar twist lock. Magnetic particle or other suitable crack detecting inspection shall be performed at least once each year. When testing by x-ray, the pertinent provisions of the Nuclear Regulatory Commission's standards for protection against radiation, relating to protection against occupational radiation exposure, shall apply.

(4) In the event that heat treatment of any loose gear is recommended by the manufacturer, the latest heat treatment certificate attesting to compliance with the manufacturer's

specifications shall be part of the available documentation. Heat treatment shall be carried out in accordance with the specifications of the manufacturer by persons competent to perform such work.

(5) Replacement parts shall be of equal or better quality than the original equipment and suitable for the purpose. Repairs or modifications shall be such as to render the equipment equal to or better than the original construction or design.

(6) In cases of foreign manufactured cranes, there shall be an owner's warranty that the design is adequate for the intended use. The warranty shall be based on a thorough examination of the design specifications by a registered professional engineer familiar with the equipment.

(7) The certifications required by this section shall be performed in accordance with WAC 296-56-60093 by persons accredited by the assistant director of consultation and compliance.

(8) The marine terminal material handling devices listed below shall be certified in the following manner:

(a) Each crane and derrick shall be tested and examined as a unit annually. A copy of the certificate of tests and examinations shall be posted in the crane operator's cab.

(b) Bulk cargo spouts and suckers, together with any portable extensions and rigging or outriggers supporting them vertically, shall be examined annually. Certificates attesting to the required examination shall be made readily available for inspection.

(c) Vertical pocket or bucket conveyors such as banana, sugar, and grain marine legs (other than those within a grain elevator structure) used within a marine terminal facility shall be examined annually. The annual examination shall include all supporting structures, rigging, mechanical components and observation of all steps of operations. Certificates attesting to the required examinations shall be readily available for inspection.

(d)(i) House fall cargo-handling gear shall be proof load tested as a unit upon initial certification and every fourth year thereafter. An examination shall be carried out in conjunction with each unit proof load test and annually thereafter. The unit test shall consist of a proof load of twenty-five percent in excess of the rated safe working load. Examinations shall include all supporting structures and components. Certificates attesting to the required tests and examinations shall be readily available for inspection.

(ii) House fall span beams or other house fall block supports shall be marked with the safe working load, which shall not be exceeded.

(e) Special gear.

(i) Special stevedoring gear provided by the employer, the strength of which depends upon components other than commonly used stock items such as shackles, ropes or chains, shall be tested as a unit in accordance with the following table before initially being put into use.

Safe Working Load	Proof Load
Up to 20 short tons	25 percent in excess
Over 20 to 50 short tons	5 short tons in excess
Over 50 short tons	10 percent in excess

(ii) Every spreader not a part of ship's gear and used for hoisting intermodal containers shall be tested to a proof load equal to twenty-five percent in excess of its rated capacity. Additionally, any spreader which suffers damage necessitating structural repair shall be retested after repair and before being returned to service.

(iii) Certificates attesting to the required tests shall be available for inspection.

(f) Wire rope and loose gear used for material handling shall be tested and certified before being placed into use in accordance with the provisions of WAC 296-56-60097. Certificates attesting to the required tests, inspections and examinations shall be available.

(9) Disassembly and reassembly of equipment does not require recertification of the equipment provided that the equipment is reassembled and used in a manner consistent with its certification.

(10) Equipment certified in Washington and transferred to a site in another state does not require recertification in this state upon its return, until the next inspection or examination becomes due as if it had not been moved. Equipment certified in accordance with similar provisions of another jurisdiction and moved to a site in this state does not require certification upon initial transfer to this state.

(11) Certification procedures shall not be construed as a substitute for, or cause for elimination of, normal operational inspection and maintenance routine throughout the year.

(12)(a) Every unit of equipment requiring annual certification shall have had such annual certification within the previous twelve months. Equipment requiring annual certification shall have had such annual certification within the previous twelve months, except that no annual certification is required within twelve months after any required certification. Annual examinations for certification may be accomplished up to one month early without effect on subsequent due dates.

(b) When certified equipment is out of service for six months or more beyond the due date of a certification inspection, an examination equivalent to an initial certification, including unit proof load test, shall be performed before the equipment re-enters service.

(13) Loose gear shall bear a legible mark indicating that it has been tested (see WAC 296-56-60097). Single sheave blocks shall be marked with safe working loads and proof test loads. Marks relating to testing shall be identifiable on the related certificates, which shall be available.

(14) The certification requirements of this section do not apply to the following equipment:

(a) Industrial trucks and small industrial crane trucks; and

(b) Any straddle truck not capable of straddling two or more intermodal containers sixteen feet (4.88 m) in width.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60098, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60098, filed 1/17/86; 85-10-004 (Order 85-09), § 296-56-60098, filed 4/19/85; 85-01-022 (Order 84-24), § 296-56-60098, filed 12/11/84.]

WAC 296-56-60235 Welding, cutting and heating (hot work). (1) Definition. "Hot work" means riveting,

welding, flame cutting or other fire or spark-producing operation.

(2) Hot work in confined spaces. Hot work shall not be performed in a confined space until all requirements of chapter 296-62 WAC, Part M, are met.

(3) Fire protection.

(a) To the extent possible, hot work shall be performed in designated locations that are free of fire hazards.

(b) When hot work must be performed in a location that is not free of fire hazards, all necessary precautions shall be taken to confine heat, sparks, and slag so that they cannot contact flammable or combustible material.

(c) Fire extinguishing equipment suitable for the location shall be immediately available and shall be maintained in readiness for use at all times.

(d) When the hot work operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire during hot work and for a sufficient time after completion of the work to ensure that no fire hazard remains. The employer shall instruct all employees involved in hot work operations as to potential fire hazards and the use of fire fighting equipment.

(e) Drums and containers which contain or have contained flammable or combustible liquids shall be kept closed. Empty containers shall be removed from the hot work area.

(f) When openings or cracks in flooring cannot be closed, precautions shall be taken to ensure that no employees or flammable or combustible materials are exposed to sparks dropping through the floor. Similar precautions shall be taken regarding cracks or holes in walls, open doorways and open or broken windows.

(g) Hot work shall not be performed:

(i) In flammable or potentially flammable atmospheres;

(ii) On or in equipment or tanks that have contained flammable gas or liquid or combustible liquid or dust-producing material, until a designated person has tested the atmosphere inside the equipment or tanks and determined that it is not hazardous; or

(iii) Near any area in which exposed readily ignitable materials such as bulk sulphur, baled paper or cotton are stored. Bulk sulphur is excluded from this prohibition if suitable precautions are followed, the person in charge is knowledgeable and the person performing the work has been instructed in preventing and extinguishing sulphur fires.

(h)(i) Drums, containers or hollow structures that have contained flammable or combustible substances shall either be filled with water or cleaned, and shall then be ventilated. A designated person shall test the atmosphere and determine that it is not hazardous before hot work is performed on or in such structures.

(ii) Before heat is applied to a drum, container or hollow structure, an opening to release built-up pressure during heat application shall be provided.

(4) Gas welding and cutting.

(a) Compressed gas cylinders:

(i) Shall have valve protection caps in place except when in use, hooked up or secured for movement. Oil shall not be used to lubricate caps;

(ii) Shall be hoisted only while secured, as on a cradle or pallet, and shall not be hoisted by magnet, choker sling or cylinder caps;

(iii) Shall be moved only by tilting or rolling on their bottom edges;

(iv) Shall be secured when moved by vehicle;

(v) Shall be secured while in use;

(vi) Shall have valves closed when cylinders are empty, being moved or stored;

(vii) Shall be secured upright except when hoisted or carried;

(viii) Shall not be freed when frozen by prying the valves or caps with bars or by hitting the valve with a tool;

(ix) Shall not be thawed by boiling water;

(x) Shall not be exposed to sparks, hot slag, or flame;

(xi) Shall not be permitted to become part of electrical circuits or have electrodes struck against them to strike arcs;

(xii) Shall not be used as rollers or supports;

(xiii) Shall not have contents used for purposes not authorized by the supplier;

(xiv) Shall not be used if damaged or defective;

(xv) Shall not have gases mixed within, except by gas suppliers;

(xvi) Shall be stored so that oxygen cylinders are separated from fuel gas cylinders and combustible materials by either a minimum distance of twenty feet (6 m) or a barrier having a fire-resistance rating of thirty minutes; and

(xvii) Shall not have objects that might either damage the safety device or obstruct the valve placed on top of the cylinder when in use.

(b) Use of fuel gas. Fuel gas shall be used only as follows:

(i) Before regulators are connected to cylinder valves, the valves shall be opened slightly (cracked) and closed immediately to clear away dust or dirt. Valves shall not be cracked if gas could reach possible sources of ignition;

(ii) Cylinder valves shall be opened slowly to prevent regulator damage and shall not be opened more than one and one-half turns. Any special wrench required for emergency closing shall be positioned on the valve stem during cylinder use. For manifolded or coupled cylinders, at least one wrench shall be immediately available. Nothing shall be placed on top of a cylinder or associated parts when the cylinder is in use;

(iii) Pressure-reducing regulators shall be attached to cylinder valves when cylinders are supplying torches or devices equipped with shut-off valves;

(iv) Cylinder valves shall be closed and gas released from the regulator or manifold before regulators are removed;

(v) Leaking fuel gas cylinder valves shall be closed and the gland nut tightened. If the leak continues, the cylinder shall be tagged, removed from service, and moved to a location where the leak will not be hazardous. If a regulator attached to a valve stops a leak, the cylinder need not be removed from the workplace but shall be tagged and may not be used again before it is repaired; and

(vi) If a plug or safety device leaks, the cylinder shall be tagged, removed from service, and moved to a location where the leak will not be hazardous.

(c) Hose.

(i) Fuel gas and oxygen hoses shall be easily distinguishable from each other by color or sense of touch. Oxygen and fuel hoses shall not be interchangeable. Hoses having more than one gas passage shall not be used.

(ii) When oxygen and fuel gas hoses are taped together, not more than four of each twelve inches (10.2 cm of each 30.5 cm) shall be taped.

(iii) Hose shall be inspected before use. Hose subjected to flashback or showing evidence of severe wear or damage shall be tested to twice the normal working pressure but not less than two hundred p.s.i. (1378.96 kPa) before re-use. Defective hose shall not be used.

(iv) Hose couplings shall not unlock or disconnect without rotary motion.

(v) Hose connections shall be clamped or securely fastened to withstand twice the normal working pressure but not less than three hundred p.s.i. (2068.44 kPa) without leaking.

(vi) Gas hose storage boxes shall be ventilated.

(d) Torches.

(i) Torch tip openings shall only be cleaned with devices designed for that purpose.

(ii) Torches shall be inspected before each use for leaking shut-off valves, hose couplings and tip connections. Torches shall be inspected before each use for leaking shut-off valves, hose couplings and tip connections. Torches with such defects shall not be used.

(iii) Torches shall not be lighted from matches, cigarette lighters, other flames or hot work.

(e) Pressure regulators. Pressure regulators, including associated gauges, shall be maintained in safe working order.

(f) Operational precaution. Gas welding equipment shall be maintained free of oil and grease.

(5) Arc welding and cutting.

(a) Manual electrode holders.

(i) The employer shall ensure that only manual electrode holders intended for arc welding and cutting and capable of handling the maximum current required for such welding or cutting shall be used.

(ii) Current-carrying parts passing through those portions of the holder gripped by the user and through the outer surfaces of the jaws of the holder shall be insulated against the maximum voltage to ground.

(b) Welding cables and connectors.

(i) Arc welding and cutting cables shall be insulated, flexible and capable of handling the maximum current required by the operation, taking into account the duty cycles.

(ii) Only cable free from repair or splice for ten feet (3 m) from the electrode holder shall be used unless insulated connectors or splices with insulating quality equal to that of the cable are provided.

(iii) When a cable other than the lead mentioned in (b)(ii) of this subsection wears and exposes bare conductors, the portion exposed shall not be used until it is protected by insulation equivalent in performance capacity to the original.

(iv) Insulated connectors of equivalent capacity shall be used for connecting or splicing cable. Cable lugs, where used as connectors, shall provide electrical contact. Exposed metal parts shall be insulated.

(c) Ground returns and machine grounding.

(i) Ground return cables shall have current-carrying capacity equal to or exceeding the total maximum output capacities of the welding or cutting units served.

(ii) Structures or pipelines, other than those containing gases or flammable liquids or conduits containing electrical circuits, may be used in the ground return circuit if their current-carrying capacity equals or exceeds the total maximum output capacities of the welding or cutting units served.

(iii) Structures or pipelines forming a temporary ground return circuit shall have electrical contact at all joints. Arcs, sparks or heat at any point in the circuit shall cause rejection as a ground circuit.

(iv) Structures or pipelines acting continuously as ground return circuits shall have joints bonded and maintained to ensure that no electrolysis or fire hazard exists.

(v) Arc welding and cutting machine frames shall be grounded, either through a third wire in the cable containing the circuit conductor or through a separate wire at the source of the current. Grounding circuits shall have resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(vi) Ground connections shall be mechanically and electrically adequate to carry the current.

(d) When electrode holders are left unattended, electrodes shall be removed and holders placed to prevent employee injury.

(e) Hot electrode holders shall not be dipped in water.

(f) The employer shall ensure that when arc welders or cutters leave or stop work or when machines are moved, the power supply switch is kept in the off position.

(g) Arc welding or cutting equipment having a functional defect shall not be used.

(h)(i) Arc welding and cutting operations shall be separated from other operations by shields, screens, or curtains to protect employees in the vicinity from the direct rays and sparks of the arc.

(ii) Employees in areas not protected from the arc by screening shall be protected by appropriate filter lenses in accordance with subsection (8) of this section. When welders are exposed to their own arc or to each other's arc, they shall wear filter lenses complying with the requirements of subsection (8) of this section.

(i) The control apparatus of arc welding machines shall be enclosed, except for operating wheels, levers, and handles.

(j) Input power terminals, top change devices and live metal parts connected to input circuits shall be enclosed and accessible only by means of insulated tools.

(k) When arc welding is performed in wet or high-humidity conditions, employees shall use additional protection, such as rubber pads or boots, against electric shock.

(6) Ventilation and employee protection in welding, cutting and heating.

(a) Mechanical ventilation requirements. The employer shall ensure that general mechanical ventilation or local exhaust systems shall meet the following requirements:

(i) General mechanical ventilation shall maintain vapors, fumes and smoke below a hazardous level;

(ii) Local exhaust ventilation shall consist of movable hoods positioned close to the work and shall be of such

capacity and arrangement as to keep breathing zone concentrations below hazardous levels;

(iii) Exhausts from working spaces shall be discharged into the open air, clear of intake air sources;

(iv) Replacement air shall be clean and respirable; and

(v) Oxygen shall not be used for ventilation, cooling or cleaning clothing or work areas.

(b) Hot work in confined spaces. Except as specified in (c)(ii) and (iii) of this subsection, when hot work is performed in a confined space the employer shall, in addition to the requirements of chapter 296-62 WAC, Part M, ensure that:

(i) General mechanical or local exhaust ventilations shall be provided; or

(ii) Employees in the space shall wear supplied air respirators in accordance with WAC 296-62-071 et seq. and a standby observer on the outside shall maintain communication with employees inside the space and shall be equipped and prepared to provide emergency aid.

(c) Welding, cutting or heating of toxic metals.

(i) In confined or enclosed spaces, hot work involving the following metals shall only be performed with general mechanical or local exhaust ventilation that ensures that employees are not exposed to hazardous levels of fumes:

(A) Lead base metals;

(B) Cadmium-bearing filler materials; and

(C) Chromium-bearing metals or metals coated with chromium-bearing materials.

(ii) In confined or enclosed spaces, hot work involving the following metals shall only be performed with local exhaust ventilation meeting the requirements of this subsection or by employees wearing supplied air respirators in accordance with chapter 296-62 WAC;

(A) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials;

(B) Metals containing lead other than as an impurity, or coated with lead-bearing materials;

(C) Cadmium-bearing or cadmium-coated base metals; and

(D) Metals coated with mercury-bearing materials.

(iii) Employees performing hot work in confined or enclosed spaces involving beryllium-containing base or filler metals shall be protected by local exhaust ventilation and wear supplied air respirators or self-contained breathing apparatus, in accordance with the requirements of chapter 296-62 WAC.

(iv) The employer shall ensure that employees performing hot work in the open air that involves any of the metals listed in (c)(i) and (ii) of this subsection shall be protected by respirators in accordance with the requirements of chapter 296-62 WAC and those working on beryllium-containing base or filler metals shall be protected by supplied air respirators, in accordance with the requirements of chapter 296-62 WAC.

(v) Any employee exposed to the same atmosphere as the welder or burner shall be protected by the same type of respiratory and other protective equipment as that worn by the welder or burner.

(d) Inert-gas metal-arc welding. Employees shall not engage in and shall not be exposed to the inert-gas metal-arc welding process unless the following precautions are taken:

(i) Chlorinated solvents shall not be used within two hundred feet (61 m) of the exposed arc. Surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is performed on them.

(ii) Employees in areas not protected from the arc by screening shall be protected by appropriate filter lenses in accordance with the requirements of subsection (8) of this section. When welders are exposed to their own arc or to each other's arc, filter lenses complying with the requirements of subsection (8) of this section shall be worn to protect against flashes and radiant energy.

(iii) Employees exposed to radiation shall have their skin covered completely to prevent ultraviolet burns and damage. Helmets and hand shields shall not have leaks, openings or highly reflective surfaces.

(iv) Inert-gas metal-arc welding on stainless steel shall not be performed unless exposed employees are protected either by local exhaust ventilation or by wearing supplied air respirators.

(7) Welding, cutting and heating on preservative coatings.

(a) Before hot work is commenced on surfaces covered by a preservative coating of unknown flammability, a test shall be made by a designated person to determine the coating's flammability. Preservative coatings shall be considered highly flammable when scrapings burn with extreme rapidity.

(b) Appropriate precaution shall be taken to prevent ignition of highly flammable hardened preservative coatings. Highly flammable coatings shall be stripped from the area to be heated. An uncoiled fire hose with fog nozzle, under pressure, shall be immediately available in the hot work area.

(c) Surfaces covered with preservative coatings shall be stripped for at least four inches (10.2 cm) from the area of heat application or employees shall be protected by supplied air respirators in accordance with the requirements of chapter 296-62 WAC.

(8) Protection against radiant energy.

(a) Employees shall be protected from radiant energy eye hazards by spectacles, cup goggles, helmets, hand shields or face shields with filter lenses complying with the requirements of this subsection.

(b) Filter lenses shall have an appropriate shade number, as indicated in Table G-1, for the work performed. Variations of one or two shade numbers are permissible to suit individual preferences.

(c) If filter lenses are used in goggles worn under the helmet, the shade numbers of both lenses equals the value shown in Table G-1 for the operation.

Table G-1.—Filter Lenses for Protection
Against Radiant Energy

Operation	Shade No.
Soldering	2
Torch Brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1-6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Light gas welding, up to 1/8 inch	4 or 5
Medium gas welding, 1/8-1/2 inch	5 or 6

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Heavy gas welding, over 1/2 inch	6 or 8
Shielded Metal-Arc Welding 1/16 to 5/32-inch electrodes	10
Inert gas Metal-Arc Welding (non-ferrous) 1/16 to 5/32-inch electrodes	11
Shielded Metal-Arc Welding: 3/16 to 1/4-inch electrodes	12
5/16 and 3/8-inch electrodes	14

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60235, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-56-60235, filed 10/30/92, effective 12/8/92. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60235, filed 1/17/86; 85-10-004 (Order 85-09), § 296-56-60235, filed 4/19/85; 85-01-022 (Order 84-24), § 296-56-60235, filed 12/11/84.]

Chapter 296-59 WAC

SAFETY STANDARDS FOR SKI AREA FACILITIES AND OPERATIONS

WAC

296-59-060 Vessel or confined area requirements.

WAC 296-59-060 Vessel or confined area requirements. The requirements of WAC 296-62-145 through 296-62-14529, general occupational health standards for permit - required confined spaces, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-59-060, filed 1/18/95, effective 3/1/95; 88-14-108 (Order 88-11), § 296-59-060, filed 7/6/88.]

Chapter 296-62 WAC

OCCUPATIONAL HEALTH STANDARDS—SAFETY STANDARDS FOR CARCINOGENS

WAC

296-62-05403	Scope and application.
296-62-05405	Definitions applicable to this part.
296-62-05407	Hazard determination.
296-62-05411	Labels and other forms of warning.
296-62-05413	Material safety data sheets.
296-62-07105	Definitions.
296-62-07521	Lead.
296-62-07711	Regulated areas.
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296-62-145	Permit-required confined spaces.
296-62-14500	Scope and application.
296-62-14501	Definitions.
296-62-14503	General requirements.
296-62-14505	Permit-required confined space program (permit space program).
296-62-14507	Permit system.
296-62-14509	Entry permit.
296-62-14511	Training.
296-62-14513	Duties of authorized entrants.
296-62-14515	Duties of attendants.
296-62-14517	Duties of entry supervisors.
296-62-14519	Rescue and emergency services.
296-62-14520	Appendices to WAC 296-62-145—Permit-required confined spaces.
296-62-14521	Appendix A—Permit-required confined space decision flow chart.
296-62-14523	Appendix B—Procedures for atmospheric testing.

(i) Chlorinated solvents shall not be used within two hundred feet (61 m) of the exposed arc. Surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is performed on them.

(ii) Employees in areas not protected from the arc by screening shall be protected by appropriate filter lenses in accordance with the requirements of subsection (8) of this section. When welders are exposed to their own arc or to each other's arc, filter lenses complying with the requirements of subsection (8) of this section shall be worn to protect against flashes and radiant energy.

(iii) Employees exposed to radiation shall have their skin covered completely to prevent ultraviolet burns and damage. Helmets and hand shields shall not have leaks, openings or highly reflective surfaces.

(iv) Inert-gas metal-arc welding on stainless steel shall not be performed unless exposed employees are protected either by local exhaust ventilation or by wearing supplied air respirators.

(7) Welding, cutting and heating on preservative coatings.

(a) Before hot work is commenced on surfaces covered by a preservative coating of unknown flammability, a test shall be made by a designated person to determine the coating's flammability. Preservative coatings shall be considered highly flammable when scrapings burn with extreme rapidity.

(b) Appropriate precaution shall be taken to prevent ignition of highly flammable hardened preservative coatings. Highly flammable coatings shall be stripped from the area to be heated. An uncoiled fire hose with fog nozzle, under pressure, shall be immediately available in the hot work area.

(c) Surfaces covered with preservative coatings shall be stripped for at least four inches (10.2 cm) from the area of heat application or employees shall be protected by supplied air respirators in accordance with the requirements of chapter 296-62 WAC.

(8) Protection against radiant energy.

(a) Employees shall be protected from radiant energy eye hazards by spectacles, cup goggles, helmets, hand shields or face shields with filter lenses complying with the requirements of this subsection.

(b) Filter lenses shall have an appropriate shade number, as indicated in Table G-1, for the work performed. Variations of one or two shade numbers are permissible to suit individual preferences.

(c) If filter lenses are used in goggles worn under the helmet, the shade numbers of both lenses equals the value shown in Table G-1 for the operation.

Table G-1.—Filter Lenses for Protection
Against Radiant Energy

Operation	Shade No.
Soldering	2
Torch Brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1-6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Light gas welding, up to 1/8 inch	4 or 5
Medium gas welding, 1/8-1/2 inch	5 or 6

[1996 WAC Supp.—page 942]

Heavy gas welding, over 1/2 inch	6 or 8
Shielded Metal-Arc Welding 1/16 to 5/32-inch electrodes	10
Inert gas Metal-Arc Welding (non-ferrous) 1/16 to 5/32-inch electrodes	11
Shielded Metal-Arc Welding: 3/16 to 1/4-inch electrodes	12
5/16 and 3/8-inch electrodes	14

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-56-60235, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-56-60235, filed 10/30/92, effective 12/8/92. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60235, filed 1/17/86; 85-10-004 (Order 85-09), § 296-56-60235, filed 4/19/85; 85-01-022 (Order 84-24), § 296-56-60235, filed 12/11/84.]

Chapter 296-59 WAC

SAFETY STANDARDS FOR SKI AREA FACILITIES AND OPERATIONS

WAC

296-59-060 Vessel or confined area requirements.

WAC 296-59-060 Vessel or confined area requirements. The requirements of WAC 296-62-145 through 296-62-14529, general occupational health standards for permit - required confined spaces, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-59-060, filed 1/18/95, effective 3/1/95; 88-14-108 (Order 88-11), § 296-59-060, filed 7/6/88.]

Chapter 296-62 WAC

OCCUPATIONAL HEALTH STANDARDS—SAFETY STANDARDS FOR CARCINOGENS

WAC

296-62-05403	Scope and application.
296-62-05405	Definitions applicable to this part.
296-62-05407	Hazard determination.
296-62-05411	Labels and other forms of warning.
296-62-05413	Material safety data sheets.
296-62-07105	Definitions.
296-62-07521	Lead.
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296-62-14513	Duties of authorized entrants.
296-62-14515	Duties of attendants.
296-62-14517	Duties of entry supervisors.
296-62-14519	Rescue and emergency services.
296-62-14520	Appendices to WAC 296-62-145—Permit-required confined spaces.
296-62-14521	Appendix A—Permit-required confined space decision flow chart.
296-62-14523	Appendix B—Procedures for atmospheric testing.

296-62-14525	Appendix C—Examples of permit-required confined space programs.
296-62-14527	Appendix D—Sample permits.
296-62-14529	Appendix E—Sewer system entry.
296-62-3010	Safety and health program.
296-62-3040	Training.
296-62-3170	Appendix B—General description and discussion of the levels of protection and protective gear.
296-62-3195	Appendix E—Training curriculum guidelines.

WAC 296-62-05403 Scope and application. (1) This part requires chemical manufacturers or importers to assess the hazards of chemicals which they produce or import, and all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program, labels and other forms of warning, material safety data sheets, and information and training. In addition, this part requires distributors to transmit the required information to employers.

Employers who do not produce or import chemicals need only focus on those parts of this rule that deal with establishing a workplace program and communicating information to their workers. Appendix E of this section is a general guide for such employers to help them determine their compliance obligations under the rule.

Even though the Occupational Safety and Health Administration (OSHA) PELs or American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit values (TLVs) may be printed on the material safety data sheet (MSDS), employers within Washington state are required to use the permissible exposure limits (PELs) established in Washington state as listed in the general occupational health standard, WAC 296-62-075, for evaluation of employee exposures and training.

(2) This part applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

(3) This part applies to laboratories only as follows:

(a) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

(b) Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees when they are in their work areas;

(c) Employers shall ensure that laboratory employees are provided information and training in accordance with WAC 296-62-05415, except for the location and availability of the written hazard communication program under WAC 296-62-05415 (1)(c); and

Note: Laboratories are not required to have a written hazard communication program, but they may be required to have a written chemical hygiene plan under WAC 296-62-400.

(d) Laboratory employers that ship hazardous chemicals are considered to be either a chemical manufacturer or a distributor under this rule, and thus must ensure that any containers of hazardous chemicals leaving the laboratory are labeled in accordance with WAC 296-62-05411, and that a material safety data sheet is provided to distributors and other employers in accordance with WAC 296-62-05413.

(4) In work operations where employees only handle chemicals in sealed containers which are not opened under

normal conditions of use (such as are found in marine cargo handling, warehousing, or retail sales), this part applies to these operations only as follows:

(a) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

(b) Employers shall maintain copies of any material safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals, shall obtain a material safety data sheet as soon as possible for sealed containers of hazardous chemicals received without a material safety data sheet if an employee requests the material safety data sheet, and shall ensure that the material safety data sheets are readily accessible during each work shift to employees when they are in their work area(s); and

(c) Employers shall ensure that employees are provided with information and training in accordance with WAC 296-62-05415 (except for the location and availability of the written hazard communication program under WAC 296-62-05415 (1)(c)) to the extent necessary to protect them in the event of a spill or leak of a hazardous chemical from a sealed container.

(5) This part does not require labeling of the following chemicals:

(a) Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when subject to the labeling requirements of that act and labeling regulations issued under that act by the Environmental Protection Agency;

(b) Any chemical substance or mixture as such terms are defined in the Toxic Substance Control Act (15 U.S.C. 2601 et seq.), when subject to the labeling requirements of that act and labeling requirements issued under that act by the Environmental Protection Agency;

(c) Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device or product, including materials intended for use as ingredients in such products (e.g., flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) or the Virus-Serum Toxin Act of 1913 (21 U.S.C. 151 et seq.) and regulations issued under those acts, when they are subject to the labeling requirements under those acts by either the Food and Drug Administration or the department of agriculture;

(d) Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, as such terms are defined in the Federal Alcohol Administration Act (27 U.S.C. 201 et seq.) and regulations issued under that act, when subject to the labeling requirements of that act and labeling regulations issued under that act by the Bureau of Alcohol, Tobacco, and Firearms;

(e) Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, when subject to a consumer product safety standard or labeling requirement of those acts, or regulations issued under those acts by the Consumer Product Safety Commission; and

(f) Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act (7

U.S.C. 1551 et seq.) and the labeling requirements issued under that act by the department of agriculture.

(6) This part does not apply to:

(a) Any hazardous waste as such term is defined by the Hazardous Waste Management Act chapter 70.105 RCW, when subject to regulations issued under that act by the department of ecology which describes specific safety, labeling, personnel training and other standards for the accumulation, handling and management of hazardous waste;

(b) Any hazardous waste as such term is defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.), when subject to regulations issued under that act by the Environmental Protection Agency;

(c) Any hazardous substance as such term is defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. 9601 et seq.), when the hazardous substance is the focus of remedial or removal action being conducted under CERCLA in accordance with Environmental Protection Agency regulations;

(d) Tobacco or tobacco products;

(e) Wood or wood products, including lumber which will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to the employees is the potential for flammability or combustibility (wood or wood products which have been treated with hazardous chemicals covered by this standard, and wood which may be subsequently sawed or cut, generating dust, are not exempted);

(f) Articles (as that term is defined in WAC 296-62-05405(1));

(g) Food or alcoholic beverages which are sold, used, or prepared in a retail establishment (such as grocery store, restaurant, or drinking place), and foods intended for personal consumption by employees while in the workplace;

(h) Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.), when it is in solid, final form for direct administration to the patient (e.g., tablets or pills); drugs which are packaged by the chemical manufacturer for sale to consumers in a retail establishment (e.g., over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (e.g., first aid supplies);

(i) Cosmetics which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace;

(j) Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substance Act (15 U.S.C. 1261 et seq.) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended;

(k) Ionizing and nonionizing radiation; and

(l) Biological hazards.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-62-05403, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-62-05403, filed 8/3/94, effective 9/12/94; 88-14-108 (Order 88-11), § 296-62-05403, filed 7/6/88; 87-24-051

(Order 87-24), § 296-62-05403, filed 11/30/87. Statutory Authority: RCW 49.17.230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05403, filed 5/22/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-05403, filed 4/19/85; 84-22-012 (Order 84-22), § 296-62-05403, filed 10/30/84; 84-13-001 (Order 84-14), § 296-62-05403, filed 6/7/84.]

WAC 296-62-05405 Definitions applicable to this part. (1) Article means a manufactured item other than a fluid or particle:

(a) Which is formed to a specific shape or design during manufacture;

(b) Which has end use function(s) dependent in whole or in part upon its shape or design during end use; and

(c) Which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under WAC 296-62-05407), and does not pose a physical hazard or health risk to employees.

(2) Chemical means any element, chemical compound or mixture of elements and/or compounds.

(3) Chemical manufacturer means an employer with a workplace where chemical(s) are produced for use or distribution.

(4) Chemical name means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

(5) Combustible liquid means any liquid having a flashpoint at or above 100°F (37.8°C), but below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up ninety-nine percent or more of the total volume of the mixture.

(6) Commercial account means an arrangement whereby a retail distributor sells hazardous chemical(s) to an employer, generally in large quantities over time and/or at costs that are below the regular retail price.

(7) Common name means any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

(8) Compressed gas means:

(a) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70°F (21.1°C); or

(b) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C); or

(c) A liquid having a vapor pressure exceeding 40 psi at 100°F (37.8°C) as determined by ASTM D-323-72.

(9) Container means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this part, pipes or piping systems are not considered to be containers.

(10) Designated representative means any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

(11) Director means the director of the department of labor and industries or his/her designee.

(12) Distributor means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

(13) Employee means an employee of an employer who is employed in the business of his or her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is personal labor for an employer under this standard whether by way of manual labor or otherwise. However, for the purposes of this part, employee shall not mean immediate family members of the officers of any corporation, partnership, sole proprietorship, or other business entity or officers of any closely held corporation engaged in agricultural production of crops or livestock. This part applies to employees who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies.

(14) Employer means any person, firm, corporation, partnership, business trust, legal representative, or other business entity that engages in any business, industry, profession, or activity in this state and employs one or more employees or who contract with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations. This part applies to employers engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.

(15) Explosive means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

(16) Exposure or exposed means that an employee is/was subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.), and includes potential (e.g., accidental or possible) exposure.

(17) Flammable means a chemical that falls into one of the following categories:

(a) Aerosol flammable means an aerosol that, when tested by the method described in 16 CFR 1500.45 yields a flame projection exceeding eighteen inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(b) Gas, flammable means:

(i) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen percent by volume or less; or

(ii) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve percent by volume, regardless of the lower limit;

(c) Liquid, flammable means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up ninety-nine percent or more of the total volume of the mixture.

(d) Solid, flammable means a solid, other than a blasting agent or explosive as defined in WAC 296-52-417 or 29

CFR 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

(18) Flashpoint means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(a) Tagliabue closed tester: (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(b) Pensky-Martens closed tester: (See American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(c) Setaflash closed tester: (See American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Note: Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

(19) Foreseeable emergency means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

(20) Hazardous chemical means any chemical which is a physical hazard or a health hazard.

(21) Hazard warning means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the specific physical and health hazard(s), including target organ effects, of the chemical(s) in the container(s). (See definition for "physical hazard" and "health hazard" to determine the hazards which must be covered.)

(22) Health hazard means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A provides further definitions and explanations of the scope of health hazards covered by this part, and Appendix B describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard.

(23) Identity means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-

references to be made among the required list of hazardous chemicals, the label and the MSDS.

(24) Immediate use means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

(25) Importer means the first business within the Customs Territory of the United States which receives hazardous chemicals produced in other countries, for the purpose of supplying them to distributors or employers within the United States.

(26) Label means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

(27) Material safety data sheet (MSDS) means written or printed material concerning a hazardous chemical which is prepared in accordance with WAC 296-62-05413.

(28) Mixture means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

(29) Organic peroxide means an organic compound that contains the bivalent-O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

(30) Oxidizer means a chemical other than a blasting agent or explosive as defined in WAC 296-52-417 or CFR 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

(31) Permissible exposure limits (PELs) refer to airborne concentrations of substances without regard to the use of respiratory protection and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect. The permissible exposure limits (PELs) shall include the following four categories:

(a) Permissible exposure limits - Time-weighted average (PEL-TWA) is the time weighted average airborne exposure to any 8-hour work shift of a 40-work week which shall not be exceeded.

(b) Permissible exposure limits - Short-term exposure limit (PEL-STEL) is the employee's 15-minute time weighted average exposure which shall not be exceeded at any time during a work day unless another time limit is specified in a parenthetical notation below the limit. If another time period is specified, the time weighted average exposure over that time period shall not be exceeded at any time during the working day.

(c) Permissible exposure limits - Ceiling (PEL-C) is the employee's exposure which shall not be exceeded during any part of the work day. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure which shall not be exceeded at any time over a working day.

(d) "Skin" notation is the potential contribution to the overall employee exposure by the cutaneous route including mucous membranes and eye, either by airborne, or more particularly, by direct contact with the substance. These substances are identified as having a "skin" notation in the OSHA and WISHA PEL tables (29 CFR Part 1910 Subpart Z and WAC 296-62-075, respectively).

(32) Physical hazard means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

(33) Produce means to manufacture, process, formulate, blend, extract, generate, emit, or repackage.

(34) Purchaser means an employer with a workplace who purchases a hazardous chemical for use within that workplace.

(35) Pyrophoric means a chemical that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below.

(36) Responsible party means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

(37) Specific chemical identity means the chemical name, Chemical Abstracts Service (CAS) registry number, or any other information that reveals the precise chemical designation of the substance.

(38) Threshold limit values (TLVs) refer to airborne concentrations of substances without regard to the use of respiratory protection and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect. The TLV includes the TLV-Time weighted average (TLV-TWA), TLV-Short term exposure limit (TLV-STEL), TLV-Ceiling (TLV-Ceiling) and "skin" notation as stated in the most recent edition of the *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices* from the American Conference of Governmental Industrial Hygienists (ACGIH).

(39) Trade secret means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. WAC 296-62-05427, Appendix D, provides a legal definition of trade secret and WAC 296-62-05417 sets out the criteria to be used in evaluating trade secrets.

(40) Unstable (reactive) means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

(41) Use means to package, handle, react, emit, extract, generate as a by-product, or transfer.

(42) Water-reactive means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

(43) Work area means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

(44) Workplace means an establishment, job site, or project, at one geographical location containing one or more work areas.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-62-05405, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-62-05405, filed 8/3/94, effective 9/12/94; 88-14-108 (Order 88-11), § 296-62-05405, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-05405, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-05405, filed 4/27/87. Statutory Authority: RCW 49.17.230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05405, filed

5/22/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-05405, filed 4/19/85; 84-22-012 (Order 84-22), § 296-62-05405, filed 10/30/84; 84-13-001 (Order 84-14), § 296-62-05405, filed 6/7/84.]

WAC 296-62-05407 Hazard determination. (1)

Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

(2) Chemical manufacturers, importers or employers evaluating chemicals shall identify and consider the available scientific evidence concerning physical and health hazards. For health hazards, evidence which is statistically significant and which is based on at least one positive study conducted in accordance with established scientific principles is considered to be sufficient to establish a hazardous effect if the results of the study meet the definitions of health hazards in this part. WAC 296-62-05421, Appendix A, shall be consulted for the scope of health hazards covered, and WAC 296-62-05423, Appendix B, shall be consulted for the criteria to be followed with respect to the completeness of the evaluation, and the data to be reported.

(3) The chemical manufacturer, importer or employer evaluating chemicals shall treat the following sources as establishing that the chemicals listed in them are hazardous:

(a) Chapter 296-62 WAC, General occupational health standard;

(b) 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA); or

(c) *Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment*, American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition).

(d) The chemical manufacturer, importer, or employer is responsible for evaluating the hazards associated with the chemicals in these source lists in accordance with this requirement of the standard.

(4) Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

(a) National Toxicology Program (NTP), Annual Report on Carcinogens (latest edition);

(b) International Agency for Research on Cancer (IARC) Monographs (latest editions);

(c) Chapter 296-62 WAC, General occupational health standards; or

(d) 29 CFR Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

Note: The *Registry of Toxic Effects of Chemical Substances* published by the National Institute for Occupational Safety and Health indicates whether a chemical has been found by NTP or IARC to be a potential carcinogen.

(5) The chemical manufacturer, importer or employer shall determine the hazards of mixtures of chemicals as follows:

(a) If a mixture has been tested as a whole to determine its hazards, the results of such testing shall be used to determine whether the mixture is hazardous;

(b) If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture, except that the mixture shall be assumed to present a carcinogenic hazard if it contains a component in concentrations of 0.1 percent or greater which is considered to be a carcinogen under WAC 296-62-05407(4);

(c) If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture; and

(d) If the chemical manufacturer, importer, or employer has evidence to indicate that a component present in the mixture in concentrations of less than one percent (or in the case of carcinogens, less than 0.1 percent) could be released in concentrations which would exceed an established WISHA or OSHA permissible exposure limit or ACGIH threshold limit value, or could present a health risk to employees in those concentrations, the mixture shall be assumed to present the same hazard.

(6) Chemical manufacturers, importers, or employers evaluating chemicals shall describe in writing the procedures they use to determine the hazards of the chemical they evaluate. The written procedures are to be made available, upon request, to employees, their designated representatives, the director or his/her designee and the National Institute of Occupational Safety and Health (NIOSH). The written description may be incorporated into the written hazard communication program required under WAC 296-62-05409.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-62-05407, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-62-05407, filed 8/3/94, effective 9/12/94; 88-14-108 (Order 88-11), § 296-62-05407, filed 7/6/88. Statutory Authority: RCW 49.17.230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05407, filed 5/22/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 84-13-001 (Order 84-14), § 296-62-05407, filed 6/7/84.]

WAC 296-62-05411 Labels and other forms of warning. (1) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

(a) Identity of the hazardous chemical(s);

(b) Appropriate hazard warnings; and

(c) Name and address of the chemical manufacturer, importer, or other responsible party.

(2)(a) For solid metal (such as a steel beam or a metal casting), solid wood, or plastic items that are not exempted as articles due to their downstream use, or shipments of whole grain, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes;

(b) The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is

to be provided prior to or at the time of the first shipment; and

(c) This exception to requiring labels on every container of hazardous chemicals is only for the solid material itself and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the material and to which employees handling the items in transit may be exposed (for example, cutting fluids or pesticides in grain).

(3) Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this part in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.) and regulations issued under that act by the department of transportation.

(4) If the hazardous chemical is regulated by WISHA or OSHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

(5) Except as provided in subsection (6) and (7) of this section, the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:

(a) Identity of the hazardous chemical(s) contained therein; and

(b) Appropriate hazard warnings, or alternatively, words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide the employees with the specific information regarding the physical and health hazards of the hazardous chemical.

(6) The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by subsection (5) of this section to be on a label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

(7) The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer. For purposes of this part, drugs which are dispensed by a pharmacy to a health care provider for direct administration to a patient are exempted from labeling.

(8) The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

(9) The employer shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

(10) The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this part if existing labels already convey the required information.

(11) Chemical manufacturers, importers, distributors, or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within three months of becoming aware of the new information. Labels on containers of hazardous chemicals shipped after that time shall contain the new information. If the chemical is not currently produced or imported, the chemical manufacturer, importers, distributor, or employer shall add the information to the label before the chemical is shipped or introduced into the workplace again.

(12) Retention of DOT markings, placards and labels.

(a) Any employer who receives a package of hazardous material which is required to be marked, labeled or placarded in accordance with the U.S. Department of Transportation's Hazardous Materials Regulations (49 CFR Parts 171 through 180) shall retain those markings, labels and placards on the package until the packaging is sufficiently cleaned of residue and purged of vapors to remove any potential hazards.

(b) Any employer who receives a freight container, rail freight car, motor vehicle, or transport vehicle that is required to be marked or placarded in accordance with the Hazardous Materials Regulations shall retain those markings and placards on the freight container, rail freight car, motor vehicle or transport vehicle until the hazardous materials which require the marking or placarding are sufficiently removed to prevent any potential hazards.

(c) Markings, placards and labels shall be maintained in a manner that ensures that they are readily visible.

(d) For nonbulk packages which will not be reshipped, the provision of this section are met if a label or other acceptable marking is affixed in accordance with the Hazard Communication Standard chapter 296-62 WAC.

(e) For the purposes of this section, the term "hazardous material" and any other terms not defined in this section have the same definition as in the Hazardous Materials Regulations (49 CFR Parts 171 through 180).

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-62-05411, filed 1/18/95, effective 3/10/95; 94-16-145, § 296-62-05411, filed 8/3/94, effective 9/12/94; 88-14-108 (Order 88-11), § 296-62-05411, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-05411, filed 4/19/85; 84-13-001 (Order 84-14), § 296-62-05411, filed 6/7/84.]

WAC 296-62-05413 Material safety data sheets. (1) Chemical manufacturers and importers shall obtain or develop a material safety data sheet (MSDS) for each hazardous chemical they produce or import. Employers shall have a material safety data sheet in the workplace for each hazardous chemical which they use.

(2) Each material safety data sheet shall be in English (although the employer may maintain copies in other languages) and shall contain at least the following information:

(a) The identity used on the label, and, except as provided for in WAC 296-62-05417 on trade secrets:

(i) If the hazardous chemical is a single substance, its chemical and common name(s);

(ii) If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself; or

(iii) If the hazardous chemical is a mixture which has not been tested as a whole:

(A) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition, except that chemicals identified as carcinogens under WAC 296-62-05407(4) shall be listed if the concentrations are 0.1% or greater; and

(B) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise less than one percent (0.1% for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established WISHA or OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees; and

(C) The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;

(b) Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

(c) The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

(d) The acute and chronic health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;

(e) The primary route(s) of entry;

(f) The WISHA or OSHA permissible exposure limit, ACGIH threshold limit value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet (the PELs and TLVs include the 8-hour TWA, STEL, ceiling value and skin notation defined in WAC 296-62-05405), where available;

(g) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by WISHA or OSHA;

(h) Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

(i) Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

(j) Emergency and first aid procedures;

(k) The date of preparation of the material safety data sheet or the last change to it; and

(1) The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

(3) If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet shall mark it to indicate that no applicable information was found.

(4) Where complex mixtures have similar hazards and contents (i.e. the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture), the chemical manufacturer, importer or employer may prepare one material safety data sheet to apply to all of these similar mixtures.

(5) The chemical manufacturer, importer or employer preparing the material safety data sheet shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination. If the chemical manufacturer, importer or employer preparing the material safety data sheet becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the material safety data sheet within three months. If the chemical is not currently being produced or imported the chemical manufacturer or importer shall add the information to the material safety data sheet before the chemical is introduced into the workplace again.

(6)(a) Chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate material safety data sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated;

(b) The chemical manufacturer or importer shall either provide material safety data sheets with the shipped containers or send them to the distributor or employer prior to or at the time of the shipment;

(c) If the material safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical, the distributor or employer shall obtain one from the chemical manufacturer or importer as soon as possible; and

(d) The chemical manufacturer or importer shall also provide distributors or employers with a material safety data sheet upon request.

(7) (a) Distributors shall ensure that material safety data sheets, and updated information, are provided to other distributors and employers with their initial shipment and with the first shipment after a material safety data sheet is updated;

(b) The distributor shall either provide material safety data sheets with the shipped containers, or send them to the other distributor or employer prior to or at the time of the shipment;

(c) Retail distributors selling hazardous chemicals to employers having a commercial account shall provide a material safety data sheet to such employers upon request, and shall post a sign or otherwise inform them that a material safety data sheet is available;

(d) Wholesale distributors selling hazardous chemicals to employers over-the-counter may also provide material safety data sheets;

(e) If an employer without a commercial account purchases a hazardous chemical from a retail distributor not required to have material safety data sheets on file (i.e., the retail distributor does not have a commercial account and does not use the materials), the retail distributor shall provide the employer, upon request, with the name, address, and telephone number of the chemical manufacturer, importer, or distributor from which a material safety data sheet can be obtained;

(f) Wholesale distributors shall also provide material safety data sheets to employers or other distributors upon request; and

(g) Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors that have informed them that the retail distributor does not sell the product to commercial accounts or open the sealed container to use it in their own workplaces.

(8) The employer shall maintain in the workplace copies of the required material safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access, microfiche, and other alternatives to maintaining paper copies of the material safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)

(9) Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the material safety data sheets may be kept at a central location at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

(10) Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in their work area(s).

(11) Material safety data sheets shall also be made readily available, upon request, to designated representatives and to the director or his/her designee in accordance with the requirements of WAC 296-62-05209. NIOSH shall also be given access to material safety data sheets in the same manner.

(12) If a purchaser has not received a material safety data sheet within thirty calendar days after making a written request to the chemical manufacturer, importer, or distributor in accordance with WAC 296-62-05413(6), he/she may make a written request for assistance to the Department of Labor and Industries, Right-to-Know Program, P.O. Box 44610, Olympia, Washington 98504-4610. Such written request shall include:

(a) A copy of the purchaser's written request to the chemical manufacturer, importer, or distributor;

(b) The name of the product suspected of containing a hazardous chemical;

(c) The identification number of the product if available;

(d) A copy of the product label if available; and

(e) The name and address of the chemical manufacturer, importer, or distributor from whom the product was obtained.

Upon receipt of a written request for material safety data sheet, the department shall attempt to procure the material safety data sheet from the chemical manufacturer, importer or distributor and upon procurement, shall forward a copy of the material safety data sheet at no cost to the purchaser. In providing this service priority will be given to small employers.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-62-05413, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-62-05413, filed 8/3/94, effective 9/12/94; 88-14-108 (Order 88-11), § 296-62-05413, filed 7/6/88. Statutory Authority: RCW 49.17.230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05413, filed 5/22/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-05413, filed 4/19/85; 84-22-012 (Order 84-22), § 296-62-05413, filed 10/30/84; 84-13-001 (Order 84-14), § 296-62-05413, filed 6/7/84.]

WAC 296-62-07105 Definitions. Abrasive-blasting respirator. See "respirator." A respirator designed to protect the wearer against inhalation of abrasive material and against impact and abrasion from rebounding abrasive material.

Accepted. Reviewed and listed as satisfactory for a specified use by the director or his or her designee.

Aerodynamic diameter. The diameter of a unit density sphere having the same settling velocity as the particle in question of whatever shape and density.

Aerosol. A system consisting of particles, solid or liquid, suspended in air.

Air-line respirator. See "respirator."

Air-purifying respirator. See "respirator."

Air-regulating valve. An adjustable valve used to regulate, but which cannot completely shut off the airflow to the facepiece, helmet, hood, or suit of an air-line respirator.

Air-supply device. A hand- or motor-operated blower for the hose mask, or a compressor or other source of respirable air for the air-line respirator.

Approved: Tested and listed as satisfactory by the Bureau of Mines (BM) of the U.S. Department of Interior, or jointly by the Mining Enforcement and Safety Administration (MESA) of the U.S. Department of Interior and the National Institute for Occupational Safety and Health (NIOSH) of the U.S. Department of Health and Human Services, or jointly by the Mine Safety and Health Administration (MSHA) of the U.S. Department of Labor and NIOSH under the provisions of Title 30, Code of Federal Regulations, Part 11.

Bioassay. A determination of the concentration of a substance in a human body by an analysis of urine, feces, blood, bone, or tissue.

Breathing tube. A tube through which air or oxygen flows to the facepiece, mouthpiece, helmet, hood, or suit.

Canister (air-purifying). A container with a filter, sorbent, or catalyst, or any combination thereof, which removes specific contaminants from the air drawn through it.

Canister (oxygen-generating). A container filled with a chemical which generates oxygen by chemical reaction.

Carcinogen. A substance known to produce cancer in some individuals following a latent period (for example: Asbestos, Chromates, radioactive particulates).

Cartridge (air-purifying). A small canister.

Catalyst. In respirator use, a substance which converts a toxic gas (or vapor) into a less-toxic gas (or vapor).

Ceiling concentration. The concentration of an airborne substance that shall not be exceeded.

Chemical-cartridge respirator. See respirator.

Contaminant. A harmful, irritating, or nuisance material that is foreign to the normal atmosphere.

Corrective lens. A lens ground to the wearer's individual corrective prescription to permit normal visual acuity.

Demand. A type of self-contained breathing apparatus or type of air-line respirator which functions due to the negative pressure created by inhalation (i.e., air flow into the facepiece on "demand").

Detachable coupling. A device which permits the respirator wearer, without using hand tools, to detach the air-supply line from that part of the respirator worn on the person.

Dust. See WAC 296-62-07001(1).

Emergency respirator use. Wearing a respirator when a hazardous atmosphere suddenly occurs that requires immediate use of a respirator either for escape from the hazardous atmosphere or for entry into the hazardous atmosphere.

Exhalation valve. A device that allows exhaled air to leave a respirator and prevents outside air from entering through the valve.

Eye-piece. A gas-tight, transparent window(s) in a full facepiece, helmet, hood, or suit, through which the wearer may see.

Facepiece. That portion of a respirator that covers the wearer's nose and mouth in quarter-mask (above the chin) or half-mask (under the chin) facepiece or that covers the nose, mouth, and eyes in a full facepiece. It is designed to make a gas-tight or particle-tight fit with the face and includes the headbands, exhalation valve(s), and connections for an air-purifying device or respirable gas source, or both.

Face shield. A device worn in front of the eyes and a portion of, or all of, the face, whose predominant function is protection of the eyes and the face.

Fibrosis-producing dust. Dust which, when inhaled, deposited, and retained in the lungs, may produce findings of fibrotic growth that may cause pulmonary disease.

Filter. A media component used in respirators to remove solid or liquid particles from the inspired air.

Filter respirator. See respirator.

Fog. A mist of sufficient concentration to perceptibly obscure vision.

Full facepiece. See facepiece.

Fume. See WAC 296-62-07001(2).

Gas. An aeriform fluid which is in the gaseous state at ordinary temperature and pressure.

Gas mask. See respirator.

Goggle. A device, with contour-shaped eyecups with glass or plastic lenses, worn over eyes and held in place by a headband or other suitable means for the protection of the eyes and eye sockets.

Half-mask facepiece. See facepiece.

Hazardous atmosphere. Any atmosphere, either immediately or not immediately dangerous to life or health, which is oxygen deficient or which contains a toxic or disease-producing contaminant.

Head harness. That part of a facepiece assembly which secures the facepiece to the wearer.

Helmet. That portion of a respirator which shields the eyes, face, neck, and other parts of the head.

High-efficiency filter. A filter which removes from air 99.97% or more of monodisperse dioctyl phthalate (DOP) particles having a mean particle diameter of 0.3 micrometer.

Hood. That portion of a respirator which completely covers the head, neck, and portions of the shoulders.

Hose mask. See respirator.

Immediately dangerous to life or health (IDLH). Any atmosphere that poses an immediate hazard to life or produces immediate irreversible debilitating effects on health.

Inhalation valve. A device that allows respirable air to enter a respirator and prevents exhaled air from leaving the respirator through the valve.

Irrespirable. Unfit for breathing.

Maximum use limit of filter, cartridge, or canister. The maximum concentration of a contaminant for which an air-purifying filter, cartridge, or canister is approved for use.

Mist. See WAC 296-62-07001(4).

Mouthpiece. That portion of a respirator which is held in the wearer's mouth and is connected to an air-purifying device or respirable gas source, or both. It is designed to make a gas-tight or particle-tight fit with the mouth.

MPCa. Maximum permissible airborne concentration. These concentrations are set by the National Committee on Radiation Protection. They are recommended maximum average concentrations of radionuclides to which a worker may be exposed, assuming that he/she works 8 hours a day, 5 days a week, and 50 weeks a year.

Negative pressure respirator. A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.

Nonroutine respirator use. Wearing a respirator when carrying out a special task that occurs infrequently.

Nose clamp. A device used with a respirator equipped with a mouthpiece that closes the nostrils of the wearer (sometimes called a nose clip).

Not immediately dangerous to life or health. Any hazardous atmosphere which may produce physical discomfort immediately, chronic poisoning after repeated exposure, or acute adverse physiological symptoms after prolonged exposure.

Odor threshold limit. The lowest concentration of a contaminant in air that can be detected by the olfactory sense.

Oxygen deficiency - immediately dangerous to life or health. An atmosphere which causes an oxygen partial pressure of 95 millimeters of mercury column or less or has less than 12.5% by volume in the freshly inspired air in the upper portion of the lungs which is saturated with water vapor.

Oxygen deficiency - not immediately dangerous to life or health. An atmosphere having an oxygen concentration

below the minimum legal requirement of 19.5% by volume or has a partial pressure of oxygen of 148 millimeters of mercury for respirable air at sea-level conditions, but above that which is immediately dangerous to life or health.

Particulate matter. A suspension of fine solid or liquid particles in air, such as: Dust, fog, fume, mist, smoke, or spray. Particulate matter suspended in air is commonly known as an aerosol.

Permissible exposure limit (PEL). The legally established time-weighted average (TWA) concentration or ceiling concentration of a contaminant that shall not be exceeded.

Permit-required confined space. See chapter 296-62 WAC, Part M.

Pneumoconiosis-producing dust. Dust which, when inhaled, deposited, and retained in the lungs, may produce signs, symptoms, and findings of pulmonary disease.

Positive-pressure respirator. A respirator in which the air pressure inside the respiratory-inlet covering is positive in relation to the air pressure of the outside atmosphere during exhalation and inhalation.

Powered air-purifying respirator. See respirator.

Pressure demand. Similar to a demand type respirator but so designed to maintain positive pressure in the facepiece at all times.

Protection factor. The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer. As used herein, a protection factor is synonymous with the fit factor assigned to a respirator facepiece by the use of qualitative and quantitative fitting tests.

Rescue respirator use. Wearing a respirator for entry into a hazardous atmosphere to rescue a person(s) in the hazardous atmosphere.

Resistance. Opposition to the flow of air, as through a canister, cartridge, particulate filter, orifice, valve, or hose.

Respirable. Suitable for breathing.

Respirator. A device designed to protect the wearer from the inhalation of harmful atmospheres.

Respiratory-inlet covering. That portion of a respirator which connects the wearer's respiratory tract to an air-purifying device or respirable gas source, or both. It may be a facepiece, helmet, hood, suit, or mouthpiece/nose clamp.

Routine respirator use. Wearing a respirator as a normal procedure when carrying out a regular and frequently repeated task.

Sanitization. The removal of dirt and the inhibiting of the action of agents that cause infection or disease.

Self-contained breathing apparatus. See respirator.

Service life. The period of time that a respirator provides adequate protection to the wearer - for example, the period of time that an air-purifying device is effective for removing a harmful substance from inspired air.

Smoke. A system which includes the products of combustion, pyrolysis, or chemical reaction of substances in the form of visible and invisible solid and liquid particles and gaseous products in air. Smoke is usually of sufficient concentration to perceptibly obscure vision.

Sorbent. A material which is contained in cartridge or canister and which removes toxic gases and vapors from the inhaled air.

Spray. A liquid, mechanically produced particle with sizes generally in the visible or macroscopic range.

Supplied-air respirator. See respirator.

Supplied-air suit. A suit that is impermeable to most particulate and gaseous contaminants and that is provided with an adequate supply of respirable air.

Time-weighted average (TWA). The average concentration of a contaminant in air during a specific time period.

Valve (air or oxygen). A device which controls the pressure, direction, or rate of flow of air or oxygen.

Vapor. The gaseous state of a substance that is solid or liquid at ordinary temperature and pressure.

Welding helmet. A device designed to provide protection for the eyes and face against intense radiant energy and molten metal splatter encountered in the welding and cutting of metals.

Window indicator. A device on a cartridge or canister that visually denotes the service life of the cartridge or canister.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-07105, filed 1/18/95, effective 3/1/95; 94-15-096 (Order 94-07), § 296-62-07105, filed 7/20/94, effective 9/20/94; 93-19-142 (Order 93-04), § 296-62-07105, filed 9/22/93, effective 11/1/93; 91-24-017 (Order 91-07), § 296-62-07105, filed 11/22/91, effective 12/24/91. RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07105, filed 7/27/81.]

WAC 296-62-07521 Lead. (1) Scope and application.

(a) This section applies to all occupational exposure to lead, except as provided in subdivision (1)(b).

(b) This section does not apply to the construction industry or to agricultural operations covered by chapter 296-306 WAC.

(2) Definitions as applicable to this part.

(a) "Action level" - employee exposure, without regard to the use of respirators, to an airborne concentration of lead of thirty micrograms per cubic meter of air (30 µg/m³) averaged over an eight-hour period.

(b) "Director" - the director of the department of labor and industries.

(c) "Lead" - metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

(3) General requirements.

(a) Employers will assess the hazards of lead in the work place and provide information to the employees about the hazards of the lead exposures to which they may be exposed.

(b) Information provided shall include:

(i) Exposure monitoring (including employee notification);

(ii) Written compliance programs;

(iii) Respiratory protection programs;

(iv) Personnel protective equipment and housekeeping;

(v) Medical surveillance and examinations;

(vi) Training requirements;

(vii) Recordkeeping requirements.

(4) Permissible exposure limit (PEL).

(a) The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micro-

grams per cubic meter of air ($50 \mu\text{g}/\text{m}^3$) averaged over an eight-hour period.

(b) If an employee is exposed to lead for more than eight hours in any work day, the permissible exposure limit, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

$$\text{Maximum permissible limit (in } \mu\text{g}/\text{m}^3) = 400 \div \text{hours worked in the day.}$$

(c) When respirators are used to supplement engineering and work practice controls to comply with the PEL and all the requirements of subsection (7) have been met, employee exposure, for the purpose of determining whether the employer has complied with the PEL, may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

(5) Exposure monitoring.

(a) General.

(i) For the purposes of subsection (5), employee exposure is that exposure which would occur if the employee were not using a respirator.

(ii) With the exception of monitoring under subdivision (5)(c), the employer shall collect full shift (for at least seven continuous hours) personal samples including at least one sample for each shift for each job classification in each work area.

(iii) Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

(b) Initial determination. Each employer who has a workplace or work operation covered by this standard shall determine if any employee may be exposed to lead at or above the action level.

(c) Basis of initial determination.

(i) The employer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any of the following, relevant considerations:

(A) Any information, observations, or calculations which would indicate employee exposure to lead;

(B) Any previous measurements of airborne lead; and

(C) Any employee complaints of symptoms which may be attributable to exposure to lead.

(ii) Monitoring for the initial determination may be limited to a representative sample of the exposed employees who the employer reasonably believes are exposed to the greatest airborne concentrations of lead in the workplace.

(iii) Measurements of airborne lead made in the preceding twelve months may be used to satisfy the requirement to monitor under item (5)(c)(i) if the sampling and analytical methods used meet the accuracy and confidence levels of subdivision (5)(i) of this section.

(d) Positive initial determination and initial monitoring.

(i) Where a determination conducted under subdivision (5)(b) and (5)(c) of this section shows the possibility of any employee exposure at or above the action level, the employer shall conduct monitoring which is representative of the exposure for each employee in the workplace who is exposed to lead.

(ii) Measurements of airborne lead made in the preceding twelve months may be used to satisfy this requirement if the sampling and analytical methods used meet the accuracy and confidence levels of subdivision (5)(i) of this section.

(e) Negative initial determination. Where a determination, conducted under subdivisions (5)(b) and (5)(c) of this section is made that no employee is exposed to airborne concentrations of lead at or above the action level, the employer shall make a written record of such determination. The record shall include at least the information specified in subdivision (5)(c) of this section and shall also include the date of determination, location within the worksite, and the name and social security number of each employee monitored.

(f) Frequency.

(i) If the initial monitoring reveals employee exposure to be below the action level the measurements need not be repeated except as otherwise provided in subdivision (5)(g) of this section.

(ii) If the initial determination or subsequent monitoring reveals employee exposure to be at or above the action level but below the permissible exposure limit the employer shall repeat monitoring in accordance with this subsection at least every six months. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least seven days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in subdivision (5)(g) of this section.

(iii) If the initial monitoring reveals that employee exposure is above the permissible exposure limit the employer shall repeat monitoring quarterly. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least seven days apart, are below the PEL but at or above the action level at which time the employer shall repeat monitoring for that employee at the frequency specified in item (5)(f)(ii), except as otherwise provided in subdivision (5)(g) of this section.

(g) Additional monitoring. Whenever there has been a production, process, control or personnel change which may result in new or additional exposure to lead, or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to lead, additional monitoring in accordance with this subsection shall be conducted.

(h) Employee notification.

(i) Within five working days after the receipt of monitoring results, the employer shall notify each employee in writing of the results which represent that employee's exposure.

(ii) Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the permissible exposure limit, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken or to be taken to reduce exposure to or below the permissible exposure limit.

(i) Accuracy of measurement. The employer shall use a method of monitoring and analysis which has an accuracy (to a confidence level of ninety-five percent) of not less than

plus or minus twenty percent for airborne concentrations of lead equal to or greater than $30 \mu\text{g}/\text{m}^3$.

(6) Methods of compliance.

(a) Engineering and work practice controls.

(i) Where any employee is exposed to lead above the permissible exposure limit for more than thirty days per year, the employer shall implement engineering and work practice controls (including administrative controls) to reduce and maintain employee exposure to lead in accordance with the implementation schedule in Table I below, except to the extent that the employer can demonstrate that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest feasible level and shall supplement them by the use of respiratory protection which complies with the requirements of subsection (7) of this section.

(ii) Where any employee is exposed to lead above the permissible exposure limit, but for thirty days or less per year, the employer shall implement engineering controls to reduce exposures to $200 \mu\text{g}/\text{m}^3$, but thereafter may implement any combination of engineering, work practice (including administrative controls), and respiratory controls to reduce and maintain employee exposure to lead to or below $50 \mu\text{g}/\text{m}^3$.

TABLE I
IMPLEMENTATION SCHEDULE

Industry ¹	Compliance Dates ²		
	200 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$
Primary lead production	(3)	² June 29, 1984	² June 29, 1991.
Secondary lead production	(3)	² June 29, 1984	² June 29, 1986.
Lead-acid battery manufacturing	(3)	² June 29, 1983	² June 29, 1986.
Automobile manufacture/ solder grinding	(3)	N/A	² June 29, 1986.
Electronics, gray iron found- ries, ink manufacture, paints and coatings man- ufacture, wall paper man- ufacture, can manufac- ture, and printing	(3)	N/A	² June 29, 1982.
Brass and bronze ingot manufacture, lead chemical manufacture, and secondary copper smelting	(3)	N/A	45 years.
Nonferrous foundries	(3)	N/A	45 years.
All other industries	(3)	N/A	42 1/2 years.

Note: ¹ Includes ancillary activities located on the same worksite.

² This date is calculated by counting, from June 29, 1981, (the date when the United States Supreme Court denied certiorari and lifted the stay on the implementation of paragraph (6)(a)), the number of years specified for the particular industry in the original lead standard for compliance with the given airborne exposure level. The denial of certiorari followed a decision of the United States Court of Appeals for the District of Columbia Circuit finding compliance with paragraph (6)(a) to be feasible for the relevant industries.

³ On effective date. This continues an obligation from WAC 296-62-07515 Table 1 which had been in effect since 1973.

⁴ Expressed as the number of years from the date on which the court lifts the stay on the implementation of paragraph (6)(a) for the particular industry.

⁵ Large nonferrous foundries (20 or more employees) are required to achieve $50 \mu\text{g}/\text{m}^3$ by means of engineering and work practice controls. Small nonferrous foundries (fewer than 20 employees), however, are only required to achieve $75 \mu\text{g}/\text{m}^3$ by such controls. All foundries are required to comply within five years.

(b) Respiratory protection. Where engineering and work practice controls do not reduce employee exposure to or below the $50 \mu\text{g}/\text{m}^3$ permissible exposure limit, the employer shall supplement these controls with respirators in accordance with subsection (7).

(c) Compliance program.

(i) Each employer shall establish and implement a written compliance program to reduce exposures to or below the permissible exposure limit, and interim levels if applicable, solely by means of engineering and work practice controls in accordance with the implementation schedule in subdivision (6)(a).

(ii) Written plans for these compliance programs shall include at least the following:

(A) A description of each operation in which lead is emitted; e.g., machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices;

(B) A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to lead;

(C) A report of the technology considered in meeting the permissible exposure limit;

(D) Air monitoring data which documents the source of lead emissions;

(E) A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;

(F) A work practice program which includes items required under subsections (8), (9) and (10) of this regulation;

(G) An administrative control schedule required by subdivision (6)(f), if applicable; and

(H) Other relevant information.

(iii) Written programs shall be submitted upon request to the director, and shall be available at the worksite for examination and copying by the director, any affected employee or authorized employee representatives.

(iv) Written programs shall be revised and updated at least every six months to reflect the current status of the program.

(d) Bypass of interim level. Where an employer's compliance plan provides for a reduction of employee exposures to or below the PEL solely by means of engineering and work practice controls in accordance with the implementation schedule in Table I, and the employer has determined that compliance with the $100 \mu\text{g}/\text{m}^3$ interim level would divert resources to the extent that it clearly precludes compliance, otherwise attainable, with the PEL by the required time, the employer may proceed with the plan to comply with the PEL in lieu of compliance with the interim level if:

(i) The compliance plan clearly documents the basis of the determination;

(ii) The employer takes all feasible steps to provide maximum protection for employees until the PEL is met; and
 (iii) The employer notifies the director in writing within ten working days of the completion or revision of the compliance plan reflecting the determination.

(e) Mechanical ventilation.

(i) When ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure shall be made at least every three months. Measurements of the system's effectiveness in controlling exposure shall be made within five days of any change in production, process, or control which might result in a change in employee exposure to lead.

(ii) Recirculation of air. If air from exhaust ventilation is recirculated into the workplace, the employer shall assure that (A) the system has a high efficiency filter with reliable back-up filter; and (B) controls to monitor the concentration of lead in the return air and to bypass the recirculation system automatically if it fails are installed, operating, and maintained.

(f) Administrative controls. If administrative controls are used as a means of reducing employees TWA exposure to lead, the employer shall establish and implement a job rotation schedule which includes:

(i) Name or identification number of each affected employee;

(ii) Duration and exposure levels at each job or work station where each affected employee is located; and

(iii) Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead.

(7) Respiratory protection.

(a) General. Where the use of respirators is required under this section, the employer shall provide, at no cost to the employee, and assure the use of respirators which comply with the requirements of this subsection. Respirators shall be used in the following circumstances:

(i) During the time period necessary to install or implement engineering or work practice controls, except that after the dates for compliance with the interim levels in Table I, no employer shall require an employee to wear a negative pressure respirator longer than 4.4 hours per day;

(ii) In work situations in which engineering and work practice controls are not sufficient to reduce exposures to or below the permissible exposure limit; and

(iii) Whenever an employee requests a respirator.

(b) Respirator selection.

(i) Where respirators are required under this section the employer shall select the appropriate respirator or combination of respirators from Table II.

TABLE II
RESPIRATORY PROTECTION FOR LEAD AEROSOLS

Airborne Concentration of Lead or Condition of Use	Required Respirator ¹
Not in excess of 0.5 mg/m ³ (10X PEL).	Half-mask, air-purifying respirator equipped with high efficiency filters. ^{2,3}
Not in excess of 2.5 mg/m ³ (50X PEL).	Full facepiece, air-purifying respirator with high efficiency filters. ³

Not in excess of 50 mg/m³ (1000X PEL).

Not in excess of 100 mg/m³ (2000X PEL).

Greater than 100 mg/m³, unknown concentration or fire fighting.

(1) Any powered, air-purifying respirator with high efficiency filters³; or (2) Half-mask supplied air respirator operated in positive-pressure mode.²

Supplied-air respirators with full facepiece, hood, helmet, or suit, operated in positive pressure mode.

Full facepiece, self-contained breathing apparatus operated in positive-pressure mode.

Note: ¹ Respirators specified for high concentrations can be used at lower concentrations of lead.

² Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.

³ A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.

(ii) The employer shall provide a powered, air-purifying respirator in lieu of the respirator specified, in Table II whenever:

(A) An employee chooses to use this type of respirator; and

(B) This respirator will provide adequate protection to the employee.

(iii) The employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(c) Respirator usage.

(i) The employer shall assure that the respirator issued to the employee exhibits minimum facepiece leakage and that the respirator is fitted properly.

(ii) Employers shall perform either quantitative or qualitative face fit tests at the time of initial fitting and at least every six months thereafter for each employee wearing negative pressure respirators. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, and shall be conducted in accordance with Appendix D. The tests shall be used to select facepieces that provide the required protection as prescribed in Table II.

(iii) If an employee exhibits difficulty in breathing during the fitting test or during use, the employer shall make available to the employee an examination in accordance with subitem (11)(c)(i)(C) of this section to determine whether the employee can wear a respirator while performing the required duty.

(d) Respirator program.

(i) The employer shall institute a respiratory protection program in accordance with WAC 296-62-071.

(ii) The employer shall permit each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

(iii) Employees who wear respirators shall be permitted to leave work areas to wash their face and respirator facepiece whenever necessary to prevent skin irritation associated with respirator use.

(8) Protective work clothing and equipment.

(a) Provision and use. If an employee is exposed to lead above the PEL, without regard to the use of respirators or where the possibility of skin or eye irritation exists, the employer shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

- (i) Coveralls or similar full-body work clothing;
- (ii) Gloves, hats, and shoes or disposable shoe coverlets;

and

(iii) Face shields, vented goggles, or other appropriate protective equipment which complies with WAC 296-24-078.

(b) Cleaning and replacement.

(i) The employer shall provide the protective clothing required in subdivision (8)(a) of this section in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 $\mu\text{g}/\text{m}^3$ of lead as an eight-hour TWA.

(ii) The employer shall provide for the cleaning, laundering, or disposal of protective clothing and equipment required by subdivision (8)(a) of this section.

(iii) The employer shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness.

(iv) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms provided for that purpose as prescribed in subdivision (10)(b) of this section.

(v) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change-room which prevents dispersion of lead outside the container.

(vi) The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

(vii) The employer shall assure that the containers of contaminated protective clothing and equipment required by subdivision (8)(b)(v) are labeled as follows:

CAUTION: CLOTHING CONTAMINATED WITH LEAD.
DO NOT REMOVE DUST BY BLOWING OR SHAKING.
DISPOSE OF LEAD CONTAMINATED WASH WATER IN
ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR
FEDERAL REGULATIONS.

(viii) The employer shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.

(9) Housekeeping.

(a) Surfaces. All surfaces shall be maintained as free as practicable of accumulations of lead.

(b) Cleaning floors.

(i) Floors and other surfaces where lead accumulates may not be cleaned by the use of compressed air.

(ii) Shovel, dry or wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.

(c) Vacuuming. Where vacuuming methods are selected, the vacuums shall be used and emptied in a manner which minimizes the reentry of lead into the workplace.

(10) Hygiene facilities and practices.

(a) The employer shall assure that in areas where employees are exposed to lead above the PEL, without regard to the use of respirators, food or beverage is not

present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in change rooms, lunchrooms, and showers required under subdivision (10)(b) through (10)(d) of this section.

(b) Change rooms.

(i) The employer shall provide clean change rooms for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.

(ii) The employer shall assure that change rooms are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.

(c) Showers.

(i) The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators, shower at the end of the work shift.

(ii) The employer shall provide shower facilities in accordance with WAC 296-24-12009.

(iii) The employer shall assure that employees who are required to shower pursuant to item (10)(c)(i) do not leave the workplace wearing any clothing or equipment worn during the work shift.

(d) Lunchrooms.

(i) The employer shall provide lunchroom facilities for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.

(ii) The employer shall assure that lunchroom facilities have a temperature controlled, positive pressure, filtered air supply, and are readily accessible to employees.

(iii) The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL without regard to the use of a respirator wash their hands and face prior to eating, drinking, smoking or applying cosmetics.

(iv) The employer shall assure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, downdraft booth, or other cleaning method.

(e) Lavatories. The employer shall provide an adequate number of lavatory facilities which comply with WAC 296-24-12009 (1) and (2).

(11) Medical surveillance.

(a) General.

(i) The employer shall institute a medical surveillance program for all employees who are or may be exposed above the action level for more than thirty days per year.

(ii) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.

(iii) The employer shall provide the required medical surveillance including multiple physician review under item (11)(c)(iii) without cost to employees and at a reasonable time and place.

(b) Biological monitoring.

(i) Blood lead and ZPP level sampling and analysis. The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee covered under item (11)(a)(i) of this section on the following schedule:

(A) At least every six months to each employee covered under item (11)(a)(i) of this section;

(B) At least every two months for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 µg/100 g of whole blood. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 µg/100 g of whole blood; and

(C) At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.

(ii) Follow-up blood sampling tests. Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal under item (12)(a)(i), the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.

(iii) Accuracy of blood lead level sampling and analysis. Blood lead level sampling and analysis provided pursuant to this section shall have an accuracy (to a confidence level of ninety-five percent) within plus or minus fifteen percent or 6 µg/100 ml, whichever is greater, and shall be conducted by a laboratory licensed by the Center for Disease Control (CDC), United States Department of Health, Education and Welfare or which has received a satisfactory grade in blood lead proficiency testing from CDC in the prior twelve months.

(iv) Employee notification. Within five working days after the receipt of biological monitoring results, the employer shall notify in writing each employee whose blood lead level exceeds 40 µg/100 g: (A) of that employee's blood lead level and (B) that the standard requires temporary medical removal with medical removal protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal under item (12)(a)(i) of this section.

(c) Medical examinations and consultations.

(i) Frequency. The employer shall make available medical examinations and consultations to each employee covered under item (11)(a)(i) of this section on the following schedule:

(A) At least annually for each employee for whom a blood sampling test conducted at any time during the preceding twelve months indicated a blood lead level at or above 40 µg/100 g;

(B) Prior to assignment for each employee being assigned for the first time to an area in which airborne concentrations of lead are at or above the action level;

(C) As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use; and

(D) As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.

(ii) Content. Medical examinations made available pursuant to subitems (11)(c)(i)(A) through (B) of this section shall include the following elements:

(A) A detailed work history and a medical history, with particular attention to past lead exposure (occupational and nonoccupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems;

(B) A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;

(C) A blood pressure measurement;

(D) A blood sample and analysis which determines:

(I) Blood lead level;

(II) Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;

(III) Zinc protoporphyrin;

(IV) Blood urea nitrogen; and

(V) Serum creatinine;

(E) A routine urinalysis with microscopic examination; and

(F) Any laboratory or other test which the examining physician deems necessary by sound medical practice.

The content of medical examinations made available pursuant to subitems (11)(c)(i)(C) through (D) of this section shall be determined by an examining physician and, if requested by an employee, shall include pregnancy testing or laboratory evaluation of male fertility.

(iii) Multiple physician review mechanism.

(A) If the employer selects the initial physician who conducts any medical examination or consultation provided to an employee under this section, the employee may designate a second physician:

(I) To review any findings, determinations or recommendations of the initial physician; and

(II) To conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

(B) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

(I) The employee informing the employer that he or she intends to seek a second medical opinion, and

(II) The employee initiating steps to make an appointment with a second physician.

(C) If the findings, determinations or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

(D) If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee through their respective physicians shall designate a third physician:

(I) To review any findings, determinations or recommendations of the prior physicians; and

(II) To conduct such examinations, consultations, laboratory tests and discussions with the prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.

(E) The employer shall act consistent with the findings, determinations and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

(iv) Information provided to examining and consulting physicians.

(A) The employer shall provide an initial physician conducting a medical examination or consultation under this section with the following information:

(I) A copy of this regulation for lead including all appendices;

(II) A description of the affected employee's duties as they relate to the employee's exposure;

(III) The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

(IV) A description of any personal protective equipment used or to be used;

(V) Prior blood lead determinations; and

(VI) All prior written medical opinions concerning the employee in the employer's possession or control.

(B) The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under this section upon request either by the second or third physician, or by the employee.

(v) Written medical opinions.

(A) The employer shall obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains the following information:

(I) The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;

(II) Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;

(III) Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a physician determines that the employee cannot wear a negative pressure respirator; and

(IV) The results of the blood lead determinations.

(B) The employer shall instruct each examining and consulting physician to:

(I) Not reveal either in the written opinion, or in any other means of communication with the employer, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and

(II) Advise the employee of any medical condition, occupational or nonoccupational, which dictates further medical examination or treatment.

(vi) Alternate physician determination mechanisms. The employer and an employee or authorized employee representative may agree upon the use of any expeditious alternate

physician determination mechanism in lieu of the multiple physician review mechanism provided by this subsection so long as the alternate mechanism otherwise satisfies the requirements contained in this subsection.

(d) Chelation.

(i) The employer shall assure that any person whom he retains, employs, supervises or controls does not engage in prophylactic chelation of any employee at any time.

(ii) If therapeutic or diagnostic chelation is to be performed by any person in item (11)(d)(i), the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring and that the employee is notified in writing prior to its occurrence.

(12) Medical removal protection.

(a) Temporary medical removal and return of an employee.

(i) Temporary removal due to elevated blood lead levels.

(A) First year of the standard. During the first year following the effective date of the standard, the employer shall remove an employee from work having a daily eight hour TWA exposure to lead at or above $100 \mu\text{g}/\text{m}^3$ on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above $80 \mu\text{g}/100 \text{ g}$ of whole blood;

(B) Second year of the standard. During the second year following the effective date of the standard, the employer shall remove an employee from work having a daily eight hour TWA exposure to lead at or above $50 \mu\text{g}/\text{m}^3$ on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above $70 \mu\text{g}/100 \text{ g}$ of whole blood;

(C) Third year of the standard, and thereafter. Beginning with the third year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above $60 \mu\text{g}/100 \text{ g}$ of whole blood; and

(D) Fifth year of the standard, and thereafter. Beginning with the fifth year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that the average of the last three blood sampling tests conducted pursuant to this section (or the average of all blood sampling tests conducted over the previous six months, whichever is longer) indicates that the employee's blood lead level is at or above $50 \mu\text{g}/100 \text{ g}$ of whole blood; provided, however, that an employee need not be removed if the last blood sampling test indicates a blood lead level at or below $40 \mu\text{g}/100 \text{ g}$ of whole blood.

(ii) Temporary removal due to a final medical determination.

(A) The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee

at increased risk of material impairment to health from exposure to lead.

(B) For the purposes of this section, the phrase "final medical determination" shall mean the outcome of the multiple physician review mechanism or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section.

(C) Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, the employer shall implement and act consistent with the recommendation.

(iii) Return of the employee to former job status.

(A) The employer shall return an employee to his or her former job status:

(I) For an employee removed due to a blood lead level at or above 80 µg/100 g, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 60 µg/100 g of whole blood;

(II) For an employee removed due to a blood lead level at or above 70 µg/100 g, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 50 µg/100 g of whole blood;

(III) For an employee removed due to a blood lead level at or above 60 µg/100 g, or due to an average blood lead level at or above 50 µg/100 g, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 40 µg/100 g of whole blood;

(IV) For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

(B) For the purposes of this section, the requirement that an employer return an employee to his or her former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

(iv) Removal of other employee special protective measure or limitations. The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

(v) Employer options pending a final medical determination. Where the multiple physician review mechanism, or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section, has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

(A) Removal. The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

(B) Return. The employer may return the employee to his or her former job status, end any special protective

measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions. If:

(I) The initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician; or

(II) The employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

(b) Medical removal protection benefits.

(i) Provision of medical removal protection benefits. The employer shall provide to an employee up to eighteen months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to this section.

(ii) Definition of medical removal protection benefits. For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that the employer shall maintain the earnings, seniority and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to lead or otherwise limited.

(iii) Follow-up medical surveillance during the period of employee removal or limitation. During the period of time that an employee is removed from normal exposure to lead or otherwise limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to this section.

(iv) Workers' compensation claims. If a removed employee files a claim for workers' compensation payments for a lead-related disability, then the employer shall continue to provide medical removal protection benefits pending disposition of the claim. To the extent that an award is made to the employee for earnings lost during the period of removal, the employer's medical removal protection obligation shall be reduced by such amount. The employer shall receive no credit for workers' compensation payments received by the employee for treatment related expenses.

(v) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

(vi) Employees whose blood lead levels do not adequately decline within eighteen months of removal. The employer shall take the following measures with respect to any employee removed from exposure to lead due to an elevated blood lead level whose blood lead level has not declined within the past eighteen months of removal so that the employee has been returned to his or her former job status:

(A) The employer shall make available to the employee a medical examination pursuant to this section to obtain a final medical determination with respect to the employee;

(B) The employer shall assure that the final medical determination obtained indicates whether or not the employee may be returned to his or her former job status, and if not, what steps should be taken to protect the employee's health;

(C) Where the final medical determination has not yet been obtained, or once obtained indicates that the employee may not yet be returned to his or her former job status, the employer shall continue to provide medical removal protection benefits to the employee until either the employee is returned to former job status, or a final medical determination is made that the employee is incapable of ever safely returning to his or her former job status.

(D) Where the employer acts pursuant to a final medical determination which permits the return of the employee to his or her former job status despite what would otherwise be an unacceptable blood lead level, later questions concerning removing the employee again shall be decided by a final medical determination. The employer need not automatically remove such an employee pursuant to the blood lead level removal criteria provided by this section.

(vii) Voluntary removal or restriction of an employee. Where an employer, although not required by this section to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by item (12)(b)(i) of this section.

(13) Employee information and training.

(a) Training program.

(i) Each employer who has a workplace in which there is a potential exposure to airborne lead at any level shall inform employees of the content of Appendices A and B of this regulation.

(ii) The employer shall institute a training program for and assure the participation of all employees who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritation exists.

(iii) The employer shall provide initial training by one hundred eighty days from the effective date for those employees covered by item (13)(a)(ii) on the standard's effective date and prior to the time of initial job assignment for those employees subsequently covered by this subsection.

(iv) The training program shall be repeated at least annually for each employee.

(v) The employer shall assure that each employee is informed of the following:

(A) The content of this standard and its appendices;

(B) The specific nature of the operations which could result in exposure to lead above the action level;

(C) The purpose, proper selection, fitting, use, and limitations of respirators;

(D) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females);

(E) The engineering controls and work practices associated with the employee's job assignment;

(F) The contents of any compliance plan in effect; and

(G) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.

(b) Access to information and training materials.

(i) The employer shall make readily available to all affected employees a copy of this standard and its appendices.

(ii) The employer shall provide, upon request, all materials relating to the employee information and training program to the director.

(iii) In addition to the information required by item (13)(a)(v), the employer shall include as part of the training program, and shall distribute to employees, any materials pertaining to the Occupational Safety and Health Act, the regulations issued pursuant to the act, and this lead standard, which are made available to the employer by the director.

(14) Signs.

(a) General.

(i) The employer may use signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs required by this subsection.

(ii) The employer shall assure that no statement appears on or near any sign required by this subsection which contradicts or detracts from the meaning of the required sign.

(b) Signs.

(i) The employer shall post the following warning signs in each work area where the PEL is exceeded:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

(ii) The employer shall assure that signs required by this subsection are illuminated and cleaned as necessary so that the legend is readily visible.

(15) Recordkeeping.

(a) Exposure monitoring.

(i) The employer shall establish and maintain an accurate record of all monitoring required in subsection (5) of this section.

(ii) This record shall include:

(A) The date(s), number, duration, location and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;

(B) A description of the sampling and analytical methods used and evidence of their accuracy;

(C) The type of respiratory protective devices worn, if any;

(D) Name, social security number, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and

(E) the environmental variables that could affect the measurement of employee exposure.

(iii) The employer shall maintain these monitoring records for at least forty years or for the duration of employment plus twenty years, whichever is longer.

(b) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by subsection (11) of this section.

(ii) This record shall include:

(A) The name, social security number, and description of the duties of the employee;

(B) A copy of the physician's written opinions;

(C) Results of any airborne exposure monitoring done for that employee and the representative exposure levels supplied to the physician; and

(D) Any employee medical complaints related to exposure to lead.

(iii) The employer shall keep, or assure that the examining physician keeps, the following medical records:

(A) A copy of the medical examination results including medical and work history required under subsection (11) of this section;

(B) A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information; and

(C) A copy of the results of biological monitoring.

(iv) The employer shall maintain or assure that the physician maintains those medical records for at least forty years, or for the duration of employment plus twenty years, whichever is longer.

(c) Medical removals.

(i) The employer shall establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to subsection (12) of this section.

(ii) Each record shall include:

(A) The name and social security number of the employee;

(B) The date on each occasion that the employee was removed from current exposure to lead as well as the corresponding date on which the employee was returned to his or her former job status;

(C) A brief explanation of how each removal was or is being accomplished; and

(D) A statement with respect to each removal indicating whether or not the reason for the removal was an elevated blood lead level.

(iii) The employer shall maintain each medical removal record for at least the duration of an employee's employment.

(d) Availability.

(i) The employer shall make available upon request all records required to be maintained by subsection (15) of this section to the director for examination and copying.

(ii) Environmental monitoring, medical removal, and medical records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217. Medical removal records shall be provided in the same manner as environmental monitoring records.

(iii) Upon request, the employer shall make an employee's medical records required to be maintained by this section available to the affected employee or former employee or to a physician or other individual designated by such affected employee or former employees for examination and copying.

(e) Transfer of records.

(i) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by subsection (15) of this section.

(ii) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records required to be maintained by this section for the prescribed period, these records shall be transmitted to the director.

(iii) At the expiration of the retention period for the records required to be maintained by this section, the employer shall notify the director at least three months prior to the disposal of such records and shall transmit those records to the director if requested within the period.

(iv) The employer shall also comply with any additional requirements involving transfer of records set forth in WAC 296-62-05215.

(16) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead conducted pursuant to subsection (5) of this section.

(b) Observation procedures.

(i) Whenever observation of the monitoring of employee exposure to lead requires entry into an area where the use of respirators, protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such respirators, clothing and such equipment, and shall require the observer to comply with all other applicable safety and health procedures.

(ii) Without interfering with the monitoring, observers shall be entitled to:

(A) Receive an explanation of the measurement procedures;

(B) Observe all steps related to the monitoring of lead performed at the place of exposure; and

(C) Record the results obtained or receive copies of the results when returned by the laboratory.

(17) Effective date. The effective date of this standard is September 6, 1980.

(18) Startup dates. All obligations of this standard commence on the effective date except as follows:

(a) The initial determination under subdivision (5)(b) shall be made as soon as possible but no later than thirty days from the effective date.

(b) Initial monitoring under subdivision (5)(d) shall be completed as soon as possible but no later than ninety days from the effective date.

(c) Initial biological monitoring and medical examinations under subsection (11) shall be completed as soon as possible but no later than one hundred eighty days from the effective date. Priority for biological monitoring and medical examinations shall be given to employees whom the employer believes to be at greatest risk from continued exposure.

(d) Initial training and education shall be completed as soon as possible but no later than one hundred eighty days from the effective date.

(e) Hygiene and lunchroom facilities under subsection (10) shall be in operation as soon as possible but no later than one year from the effective year.

(f) Respiratory protection required by subsection (7) shall be provided as soon as possible but no later than the following schedule:

(i) Employees whose eight-hour TWA exposure exceeds 200 $\mu\text{g}/\text{m}^3$ - on the effective date.

(ii) Employees whose eight-hour TWA exposure exceeds the PEL but is less than 200 $\mu\text{g}/\text{m}^3$ - one hundred fifty days from the effective date.

(iii) Powered, air-purifying respirators provided under (7)(b)(ii) - two hundred ten days from the effective date.

(iv) Quantitative fit testing required under item (7)(c)(ii) - one year from effective date. Qualitative fit testing is required in the interim.

(g) Written compliance plans required by subdivision (6)(c) shall be completed and available for inspection and copying as soon as possible but no later than the following schedule:

(i) Employers for whom compliance with the PEL or interim level is required within one year from the effective date - six months from the effective date.

(ii) Employers in secondary lead smelting and refining and in lead storage battery manufacturing—one year from the effective date.

(iii) Employers in primary smelting and refining industry - one year from the effective date from the interim level; five years from the effective date for PEL.

(iv) Plans for construction of hygiene facilities, if required - six months from the effective date.

(v) All other industries—one year from the date on which the court lifts the stay on the implementation of paragraph (6)(a) for the particular industry.

(h) The permissible exposure limit in subsection (4) shall become effective one hundred fifty days from the effective date.

(19) Appendices. The information contained in the appendices to this section is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation.

(a) Appendix A. Substance Data Sheet for Occupational Exposure to Lead.

(i) Substance identification.

(A) Substance. Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

(B) Compounds covered by the standard. The word "lead" when used in this standard means elemental lead, all inorganic lead compounds (except those which are not biologically available due to either solubility or specific chemical interaction), and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.

(C) Uses. Exposure to lead occurs in at least 120 different occupations, including primary and secondary lead smelting, lead storage battery manufacturing, lead pigment manufacturing and use, solder manufacturing and use, shipbuilding and ship repairing, auto manufacturing, and printing.

(D) Permissible exposure. The Permissible Exposure Limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air (50 $\mu\text{g}/\text{m}^3$), averaged over an eight-hour work day.

(E) Action level. The standard establishes an action level of 30 micrograms per cubic meter of air (30 $\mu\text{g}/\text{m}^3$) time weighted average, based on an eight-hour work day. The action level initiates several requirements of the standard, such as exposure monitoring, medical surveillance, and training and education.

(ii) Health hazard data.

(A) Ways in which lead enters your body.

(I) When absorbed into your body in certain doses lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed.

(II) Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume or mist, it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion.

(III) A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in your blood and other tissue. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

(B) Effects of overexposure to lead.

(I) Short-term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short-term dose of lead can lead to acute encephalopathy. Short-term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

(II) Long-term (chronic) overexposure.

a) Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the

mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain.

b) Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

c) Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression of kidney dialysis or death is possible.

d) Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood.

e) Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.

(III) Health protection goals of the standard.

a) Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that worker blood lead (PbB) levels be maintained at or below forty micrograms per one hundred grams of whole blood (40 $\mu\text{g}/100\text{g}$). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 $\mu\text{g}/100\text{g}$ to minimize adverse reproductive health effects to the parents and to the developing fetus.

b) The measurement of your blood lead level is the most useful indicator of the amount of lead absorbed by your body. Blood lead levels (PbB) are most often reported in units of milligrams (mg) or micrograms (μg) of lead (1

$\text{mg}=1000\text{ }\mu\text{g}$) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometimes PbB's are expressed in the form of $\text{mg}\%$ or $\mu\text{g}\%$. This is a shorthand notation for 100g, 100ml, or dl.

c) PbB measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. PbB measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between PbBs and various diseases. As a result, your PbB is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

d) Once your blood lead level climbs above 40 $\mu\text{g}/100\text{g}$, your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular PbB in a given person will cause a particular effect. Studies have associated fatal encephalopathy with PbBs as low as 150 $\mu\text{g}/100\text{g}$. Other studies have shown other forms of disease in some workers with PbBs well below 80 $\mu\text{g}/100\text{g}$. Your PbB is a crucial indicator of the risks to your health, but one other factor is extremely important. This factor is the length of time you have had elevated PbBs. The longer you have an elevated PbB, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage.

e) The best way to prevent all forms of lead-related impairments and diseases—both short-term and long-term—is to maintain your PbB below 40 $\mu\text{g}/100\text{g}$. The provisions of the standard are designed with this end in mind. Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own action, and seeing that your employer complies with the provisions governing his actions.

(IV) Reporting signs and symptoms of health problems. You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead on your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place.

(b) Appendix B. Employee Standard Summary. This appendix summarizes key provisions of the standard that you as a worker should become familiar with. The appendix discusses the entire standard.

(i) Permissible exposure limit (PEL). The standard sets a permissible exposure limit (PEL) of fifty micrograms of lead per cubic meter of air ($50 \mu\text{g}/\text{m}^3$), averaged over an eight-hour workday. This is the highest level of lead in air to which you may be permissibly exposed over an eight-hour workday. Since it is an eight-hour average it permits short exposures above the PEL so long as for each eight-hour workday your average exposure does not exceed the PEL.

(ii) Exposure monitoring.

(A) If lead is present in the work place where you work in any quantity, your employer is required to make an initial determination of whether the action level is exceeded for any employee. The initial determination must include instrument monitoring of the air for the presence of lead and must cover the exposure of a representative number of employees who are reasonably believed to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past year he may use these results. If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination. If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level ($30 \mu\text{g}/\text{m}^3$) your employer must set up an air monitoring program to determine the exposure level of every employee exposed to lead at your work place.

(B) In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but he or she must monitor a representative number of employees and job types. Enough sampling must be done to enable each employee's exposure level to be reasonably represented by at least one full shift (at least seven hours) air sample. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead.

(C) If you are exposed to lead and air sampling is performed, your employer is required to quickly notify you in writing of air monitoring results which represent your exposure. If the results indicate your exposure exceeds the PEL (without regard to your use of respirators), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that will be taken to reduce your exposure.

(D) Your exposure must be rechecked by monitoring every six months if your exposure is over the action level but below the PEL. Air monitoring must be repeated every three months if you are exposed over the PEL. Your employer may discontinue monitoring for you if two consecutive measurements, taken at least two weeks apart, are below the action level. However, whenever there is a production, process, control, or personnel change at your work place which may result in new or additional exposure to lead, or whenever there is any other reason to suspect a change which may result in new or additional exposure to lead, your employer must perform additional monitoring.

(iii) Methods of compliance. Your employer is required to assure that no employee is exposed to lead in excess of the PEL. The standard establishes a priority of methods to be used to meet the PEL.

(iv) Respiratory protection.

(A) Your employer is required to provide and assure your use of respirators when your exposure to lead is not controlled below the PEL by other means. The employer must pay the cost of the respirator. Whenever you request one, your employer is also required to provide you a respirator even if your air exposure level does not exceed the PEL. You might desire a respirator when, for example, you have received medical advice that your lead absorption should be decreased. Or, you may intend to have children in the near future, and want to reduce the level of lead in your body to minimize adverse reproductive effects. While respirators are the least satisfactory means of controlling your exposure, they are capable of providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and replaced when they stop providing adequate protection.

(B) Your employer is required to select respirators from the seven types listed in Table II of the respiratory protection section of chapter 296-62 WAC. Any respirator chosen must be approved by the Mine Safety and Health Administration (MSHA) or the National Institute for Occupational Safety and Health (NIOSH). This respirator selection table will enable your employer to choose a type of respirator which will give you a proper amount of protection based on your airborne lead exposure. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present in your work place. For example, a powered air purifying respirator (PAPR) is much more protective than a typical negative-pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge or canister to clean the air, and a power source which continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long periods of time.

(C) Your employer must also start a respiratory protection program. This program must include written procedures for the proper selection, use, cleaning, storage, and maintenance of respirators.

(D) Your employer must assure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical. Obtaining a proper fit on each employee may require your employer to make available two or three different mask types. Any respirator which has a filter, cartridge or canister which cleans the work room air before you breathe it and which requires the force of your inhalation to draw air through the filtering element is a negative pressure respirator. A positive pressure respirator supplies air to you directly. A quantitative fit test uses a sophisticated machine to measure the amount, if any, of test material that leaks into the facepiece of your respirator. Appendix D describes "qualitative" procedures which are acceptable under certain conditions.

(E) You must also receive from your employer proper training in the use of respirators. Your employer is required to teach you how to wear a respirator, to know why it is needed, and to understand its limitations.

(F) The standard provides that if your respirator uses filter elements, you must be given an opportunity to change the filter elements whenever an increase in breathing resistance is detected. You also must be permitted to

periodically leave your work area to wash your face and respirator facepiece whenever necessary to prevent skin irritation. If you ever have difficulty breathing during a fit test or while using a respirator, your employer must make a medical examination available to you to determine whether you can safely wear a respirator. The result of this examination may be to give you a positive pressure respirator (which reduces breathing resistance) or to provide alternative means of protection.

(v) Protective work clothing and equipment. If you are exposed to lead above the PEL, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than $200 \mu\text{g}/\text{m}^3$. Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. He or she is responsible for providing repairs and replacement as necessary and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment. Contaminated work clothing or equipment must be removed in change rooms and not worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc. Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room. At no time may lead be removed from protective clothing or equipment by any means which disperses lead into the work room air.

(vi) Housekeeping. Your employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is absolutely prohibited. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used and emptied in a manner which minimizes the reentry of lead into the work place.

(vii) Hygiene facilities and practices.

(A) The standard requires that change rooms, showers and filtered air lunchrooms be constructed and made available to workers exposed to lead above the PEL. When the PEL is exceeded, the employer must assure that food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in these facilities. Change rooms, showers and lunchrooms, must be used by workers exposed in excess of the PEL. After showering, no clothing or equipment worn during the shift may be worn home and this includes shoes and underwear. Your own clothing worn during the shift should be carried home and cleaned carefully so that it does not contaminate your home. Lunchrooms may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth or other cleaning methods. Finally, workers exposed above the PEL

must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

(B) All of the facilities and hygiene practices just discussed are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes or your possessions. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.

(viii) Medical surveillance.

(A) The medical surveillance program is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have effectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers (I) who have high body burdens of lead acquired over past years, (II) who have additional uncontrolled sources of nonoccupational lead exposure, (III) who exhibit unusual variations in lead absorption rates, or (IV) who have specific nonwork related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia). In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability - regardless of whether you are a man or a woman.

(B) All medical surveillance required by the standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts - periodic biological monitoring, and medical examinations.

(C) Your employer's obligation to offer medical surveillance is triggered by the results of the air monitoring program. Medical surveillance must be made available to all employees who are exposed in excess of the action level for more than 30 days a year. The initial phase of the medical surveillance program, which included blood lead level tests and medical examinations, must be completed for all covered employees no later than 180 days from the effective date of this standard. Priority within this first round of medical surveillance must be given to employees whom the employer believes to be at greatest risk from continued exposure (for example, those with the longest prior exposure to lead, or those with the highest current exposure). Thereafter, the employer must periodically make medical surveillance - both biological monitoring and medical examinations - available to all covered employees.

(D) Biological monitoring under the standard consists of blood lead level (PbB) and zinc protoporphyrin tests at least every six months after the initial PbB test. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an effect of lead on your body. If a worker's PbB exceeds $40 \mu\text{g}/100\text{g}$, the monitoring frequency must be increased from every six months to at least every two months and not

reduced until two consecutive PbBs indicate a blood lead level below 40 µg/100g. Each time your PbB is determined to be over 40µg/100g, your employer must notify you of this in writing within five working days of the receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your PbB exceeds certain criteria (see Discussion of Medical Removal Protection - subsection (12)). During the first year of the standard, this removal criterion is 80 µg/100g. Anytime your PbB exceeds 80 µg/100g your employer must make available to you a prompt follow-up PbB test to ascertain your PbB. If the two tests both exceed 80 µg/100g and you are temporarily removed, then your employer must make successive PbB tests available to you on a monthly basis during the period of your removal.

(E) Medical examinations beyond the initial one must be made available on an annual basis if your blood lead levels exceeds 40µg/100g at any time during the preceding year. The initial examination will provide information to establish a baseline to which subsequent data can be compared. An initial medical examination must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

(F) Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard (see item (ix) below).

(G) The standard specifies the minimum content of preassignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Preassignment and annual medical examinations must include (I) a detailed work history and medical history, (II) a thorough physical examination, and (III) a series of laboratory tests designed to check your blood chemistry and your kidney function. In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

(H) The standard does not require that you participate in any of the medical procedures, tests, etc., which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. Generally, your employer will choose the physician who conducts medical surveillance under the lead standard - unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical

laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers.

(I) The standard requires your employer to provide certain information to a physician to aid in his or her examination of you. This information includes (I) the standard and its appendices, (II) a description of your duties as they relate to lead exposure, (III) your exposure level, (IV) a description of personal protective equipment you wear, (V) prior blood level results, and (VI) prior written medical opinions concerning you that the employer has. After a medical examination or consultation the physician must prepare a written report which must contain (I) the physician's opinion as to whether you have any medical conditions which places you at increased risk of material impairment to health from exposure to lead, (II) any recommended special protective measures to be provided to you, (III) any blood lead level determinations, and (IV) any recommended limitation on your use of respirators. This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator.

(J) The medical surveillance program of the lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons. Some states have laws, including worker compensation laws, that disallow a worker to learn of a job-related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that WISHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance program can significantly affect the legal remedies of a worker who has acquired a job-related disease or impairment, it is proper for WISHA to make you aware of this.

(K) The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most widely used chelating agents are calcium disodium EDTA, (Ca Na₂EDTA), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

(L) The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises

or controls. "Prophylactic chelation" is the routine use of chelating or similarly acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to predesignated concentrations believed to be safe. It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic chelation. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting.

(M) The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation, involves giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning.

(N) In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

(ix) Medical removal protection.

(A) Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when for whatever reasons, other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection you need. MRP involves the temporary removal of a worker from his or her regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights of benefits. The purpose of this program is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. Up to eighteen months of protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires. The standard contains special provisions to deal with the extraordinary but possible case where a long-term worker's blood lead level does not adequately decline during eighteen months of removal.

(B) During the first year of the standard, if your blood lead level is 80 $\mu\text{g}/100\text{g}$ or above you must be removed from any exposure where your air lead level without a respirator would be 100 $\mu\text{g}/\text{m}^3$ or above. If you are removed from your normal job you may not be returned until your blood lead level declines to at least 60 $\mu\text{g}/100\text{g}$. These criteria for removal and return will change according to the following schedule:

TABLE 1

Effective Date	Removal Blood Level ($\mu\text{g}/100\text{g}$)	Air Lead ($\mu\text{g}/\text{m}^3$)	Return Blood Lead ($\mu\text{g}/100\text{g}$)
9/6/81	At or above 70	50 or above	At or below 50
9/6/82	At or above 60	30 or above	At or below 40
9/6/84	At or above 50	30 or above	At or below 40
	averaged over six months		

(C) You may also be removed from exposure even if your blood lead levels are below these criteria if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the physician indicates it is safe for you to do so.

(D) The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no attempt is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

(E) In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that the time weighted average exposure is reduced, or he or she may be temporarily laid off if no other alternative is feasible.

(F) In all of these situations, MRP benefits must be provided during the period of removal - i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings include more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the physician believes to be appropriate. If you do not participate in this follow-up medical surveillance, you may lose your eligibility for MRP benefits.

(G) When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred, that is where you go back. If not, you are returned consistent with whatever job assignment

discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.

(H) If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

(I) The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirators cannot be used as a substitute. Respirators may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to a lay-off with MRP benefits.

(x) Employee information and training.

(A) Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead. This program must inform these employees of the specific hazards associated with their work environment, protective measures which can be taken, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. In addition, your employer must make readily available to all employees, included those exposed below the action level, a copy of the standard and its appendices and must distribute to all employees any materials provided to the employer under the Washington Industrial Safety and Health Act (WISHA).

(B) Your employer is required to complete this training for all employees by March 4, 1981. After this date, all new employees must be trained prior to initial assignment to areas where there is possibility of exposure over the action level. This training program must also be provided at least annually thereafter.

(xi) Signs. The standard requires that the following warning sign be posted in work areas where the exposure to lead exceeds the PEL:

WARNING
LEAD WORK AREA
NO SMOKING OR EATING

(xii) Recordkeeping.

(A) Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytic techniques, the results of this sampling and the type of respiratory protection being worn by the person sampled. Your employer is also required to keep all records of biological monitoring and medical examination results. These must include the names of the employees, the physician's written opinion and a copy of the results of the examination. All of the above kinds of records must be kept for 40 years, or for at least 20 years after your termination of employment, whichever is longer.

(B) Recordkeeping is also required if you are temporarily removed from your job under the MRP program. This record must include your name and social security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.

(C) The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than PbBs must also be provided to you upon request, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

(xiii) Observations of monitoring. When air monitoring for lead is performed at your work place as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the areas that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

(xiv) Effective date. The standard's effective date is September 6, 1980, and the employer's obligation under the standard begin to come into effect as of that date. The standard was originally adopted as WAC 296-62-07349 and later recodified to WAC 296-62-07521.

(c) Appendix C. Medical Surveillance Guidelines.

(i) Introduction.

(A) The primary purpose of the Washington Industrial Safety and Health Act of 1973 is to assure, so far as possible, safe and healthful working conditions for every working man and woman. The occupational health standard for inorganic lead* was promulgated to protect workers exposed to inorganic lead including metallic lead, all inorganic lead compounds and organic lead soaps.

*The term inorganic lead used throughout the medical surveillance appendices is meant to be synonymous with the definition of lead set forth in the standard.

(B) Under this final standard in effect as of September 6, 1980, occupational exposure to inorganic lead is to be limited to 50 $\mu\text{g}/\text{m}^3$ (micrograms per cubic meter) based on an eight-hour time-weighted average (TWA). This level of exposure eventually must be achieved through a combination of engineering, work practice and other administrative controls. Periods of time ranging from one to ten years are provided for different industries to implement these controls which are based on individual industry considerations. Until these controls are in place, respirators must be used to meet the 50 $\mu\text{g}/\text{m}^3$ exposure limit.

(C) The standard also provides for a program of biological monitoring and medical surveillance for all

employees exposed to levels of inorganic lead above the action level of $30 \mu\text{g}/\text{m}^3$ for more than thirty days per year.

(D) The purpose of this document is to outline the medical surveillance provisions of the standard for inorganic lead, and to provide further information to the physician regarding the examination and evaluation of workers exposed to inorganic lead.

(E) Item (ii) provides a detailed description of the monitoring procedure including the required frequency of blood testing for exposed workers, provisions for medical removal protection (MRP), the recommended right of the employee to a second medical opinion, and notification and recordkeeping requirements of the employer. A discussion of the requirements for respirator use and respirator monitoring and WISHA's position on prophylactic chelation therapy are also included in this section.

(F) Item (iii) discusses the toxic effects and clinical manifestations of lead poisoning and effects of lead intoxication on enzymatic pathways in heme synthesis. The adverse effects on both male and female reproductive capacity and on the fetus are also discussed.

(G) Item (iv) outlines the recommended medical evaluation of the worker exposed to inorganic lead including details of the medical history, physical examination, and recommended laboratory tests, which are based on the toxic effects of lead as discussed in item (ii).

(H) Item (v) provides detailed information concerning the laboratory tests available for the monitoring of exposed workers. Included also is a discussion of the relative value of each test and the limitations and precautions which are necessary in the interpretation of the laboratory results.

(I) Airborne levels to be achieved without reliance on respirator protection through a combination of engineering and work practice or other administrative controls are illustrated in the following table:

Industry	Permissible Lead Level/Compliance Date		
	$200 \mu\text{g}/\text{m}^3$	$100 \mu\text{g}/\text{m}^3$	$50 \mu\text{g}/\text{m}^3$
Primary Lead Production	1973	06/29/84	06/29/91
Secondary Lead Production	1973	06/29/84	06/29/91
Lead Acid Battery Manufacturing	1973	06/29/83	06/29/91
Automobile Mfg./Solder, Grinding	1973	N/A	03/08/97
Electronics, Gray Iron Foundries, Ink Mfg., Paints and Coatings Mfg., Can Mfg., Wallpaper Mfg., and Printing.	1973	N/A	06/29/91
Lead Chemical Mfg., Nonferrous Foundries, Leaded Steel Mfg., Battery Breaking in the Collection and Processing of Scrap (when not a part of secondary lead smelter)			
Secondary Copper Smelter, Brass and Bronze Ingot Production.	1973	N/A	N/A ^{1*}
All Other Industries	1973	N/A	09/08/92

* Feasibility of achieving the PEL by engineering and work practice controls for these industries has yet to be resolved in court, therefore no date has been scheduled.

(ii) Medical surveillance and monitoring requirements for workers exposed to inorganic lead.

(A) Under the occupational health standard for inorganic lead, a program of biological monitoring and medical surveillance is to be made available to all employees exposed to lead above the action level of $30 \mu\text{g}/\text{m}^3$ TWA for more than thirty days each year. This program consists of periodic blood sampling and medical evaluation to be performed on a schedule which is defined by previous laboratory results, worker complaints or concerns, and the clinical assessment of the examining physician.

(B) Under this program, the blood lead level of all employees who are exposed to lead above the action level of $30 \mu\text{g}/\text{m}^3$ is to be determined at least every six months. The frequency is increased to every two months for employees whose last blood lead level was between $40 \mu\text{g}/100\text{g}$ whole blood and the level requiring employee medical removal to be discussed below. For employees who are removed from exposure to lead due to an elevated blood lead, a new blood lead level must be measured monthly. Zinc protoporphyrin (ZPP) measurement is strongly recommended on each occasion that a blood lead level measurement is made.

(C) An annual medical examination and consultation performed under the guidelines discussed in item (iv) is to be made available to each employee for whom a blood test conducted at any time during the preceding twelve months indicated a blood lead level at or above $40 \mu\text{g}/100\text{g}$. Also, an examination is to be given to all employees prior to their assignment to an area in which airborne lead concentrations reach or exceed the action level. In addition, a medical examination must be provided as soon as possible after notification by an employee that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice regarding lead exposure and the ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during respirator use. An examination is also to be made available to each employee removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited or specially protected pursuant to medical recommendations.

(D) Results of biological monitoring or the recommendations of an examining physician may necessitate removal of an employee from further lead exposure pursuant to the standard's medical removal program (MRP). The object of the MRP program is to provide temporary medical removals to workers either with substantially elevated blood lead levels or otherwise at risk of sustaining material health impairment from continued substantial exposure to lead. The following guidelines which are summarized in Table 10 were created under the standard for the temporary removal of an exposed employee and his or her subsequent return to work in an exposure area.

TABLE 19

	Effective Date:				
	Sept. 6, 1980	Sept. 6, 1981	Sept. 6, 1982	Sept. 6, 1983	Sept. 6, 1984 (final)
Blood lead level requiring employee medical removal (level must be confirmed with second follow-up blood lead level within two weeks of first report.)	> 80 µg/100g.	> 70 µg/100g.	> 60 µg/100g.	> 60 µg/100g	> 60 µg/100g or average of last three blood samples or all blood samples over previous 6 months (whichever is over a longer time period) is 50 µg/100g or greater unless last blood sample is 40 µg/100g or less.
Frequency which employees exposed to action level of lead (30 µg/m ³ TWA) must have blood lead level checked. (ZPP is also strongly recommended in each occasion that a blood test is obtained):					
1. Last blood lead level less than 40 µg/100g.....	Every 6 months.	Every 6 months.	Every 6 months.	Every 6 months.	Every 6 months.
2. Last blood lead level between 40 µg/100g and level requiring medical removal (see A above)....	Every 2 months.	Every 2 months.	Every 2 months.	Every 2 months.	Every 2 months.
3. Employees removed from exposure to lead because of an elevated blood lead level.....	Every 1 month	Every 1 month	Every 1 month	Every 1 month	Every 1 month
Permissible airborne exposure limit for workers removed from work due to an elevated blood lead level (without regard to respirator protection).	100 µg/m ³ 8 hr TWA	50 µg/m ³ 8 hr TWA	30 µg/m ³ 8 hr TWA	30 µg/m ³ 8 hr TWA	30 µg/m ³ 8 hr TWA
Blood lead level confirmed with a second blood analysis, at which employee may return to work.					
Permissible exposure without regard to respirator protection is listed by industry in Table 1.	> 60 µg/100g	> 50 µg/100g	> 40 µg/100g	> 40 µg/100g	> 40 µg/100g

NOTE: When medical opinion indicates that an employee is at risk of material impairment from exposure to lead, the physician can remove an employee from exposures exceeding the action level (or less) or recommend special protective measures as deemed appropriate and necessary. Medical monitoring during the medical removal period can be more stringent than noted in the table above if the physician so specifies. Return to work or removal of limitations and special protections is permitted when the physician indicates that the worker is no longer at risk of material impairment.

(E) Under the standard's ultimate worker removal criteria, a worker is to be removed from any work having any eight-hour TWA exposure to lead of 30 µg/m³ or more whenever either of the following circumstances apply. (I) a blood lead level of 60 µg/100g or greater is obtained and confirmed by a second follow-up blood lead level performed within two weeks after the employer receives the results of the first blood sample test, or (II) the average of the previous three blood lead determinations or the average of all blood lead determinations conducted during the previous six months, whichever encompasses the longest time period, equals or exceeds 50 µg/100g, unless the last blood sample indicates a blood lead level at or below 40 µg/100g, in which case the employee need not be removed. Medical removal is to continue until two consecutive blood lead levels are 40 µg/100g or less.

(F) During the first two years that the ultimate removal criteria are being phased in, the return criteria have been set to assure that a worker's blood lead level has substantially declined during the period of removal. From March 1, 1979, to March 1, 1980, the blood lead level requiring employee medical removal is 80 µg/100g. Workers found to have a confirmed blood lead at this level or greater need only be removed from work having a daily eight hour TWA exposure to lead at or above 100 µg/m³. Workers so removed are to be returned to work when their blood lead levels are at or below 60 µg/100g of whole blood. From March 1, 1980, to March 1, 1981, the blood lead level requiring medical

removal is 70 µg/100g. During this period workers need only be removed from jobs having a daily eight hour TWA exposure to lead at or above 50 µg/m³ and are to be returned to work when a level of 50 µg/100g is achieved. Beginning March 1, 1981, return depends on the worker's blood lead level declining to 40 µg/100g of whole blood.

(G) As part of the standard, the employer is required to notify in writing each employee whose whole blood lead level exceeds 40 µg/100g. In addition, each such employee is to be informed that the standard requires medical removal with MRP benefits, discussed below, when an employee's blood lead level exceeds the above defined limits.

(H) In addition to the above blood lead level criteria, temporary worker removal may also take place as a result of medical determinations and recommendations. Written medical opinions must be prepared after each examination pursuant to the standard. If the examining physician includes medical finding, determination or opinion that the employee has a medical condition which places the employee at increased risk of material health impairment from exposure to lead, then the employee must be removed from exposure to lead at or above the action level. Alternatively, if the examining physician recommends special protective measures for an employee (e.g., use of a powered air purifying respirator) or recommends limitations on an employee's exposure to lead, then the employer must implement these recommendations. Recommendations may be more stringent than the specific provisions of the stan-

dard. The examining physician, therefore, is given broad flexibility to tailor special protective procedures to the needs of individual employees. This flexibility extends to the evaluation and management of pregnant workers and male and female workers who are planning to conceive children. Based on the history, physical examination, and laboratory studies, the physician might recommend special protective measures or medical removal for an employee who is pregnant or who is planning to conceive a child when, in the physician's judgment, continued exposure to lead at the current job would pose a significant risk. The return of the employee to his or her former job status, or the removal of special protections or limitations, depends upon the examining physician determining that the employee is no longer at increased risk of material impairment or that the special measures are no longer needed.

(I) During the period of any form of special protection or removal, the employer must maintain the worker's earnings, seniority, and other employment rights and benefits (as though the worker has not been removed) for a period of up to eighteen months. This economic protection will maximize meaningful worker participation in the medical surveillance program, and is appropriate as part of the employer's overall obligation to provide a safe and healthful work place. The provisions of MRP benefits during the employee's removal period may, however, be conditioned upon participation in medical surveillance.

(J) On rare occasions, an employee's blood lead level may not acceptably decline within eighteen months of removal. This situation will arise only in unusual circumstances, thus the standard relies on an individual medical examination to determine how to protect such an employee. This medical determination is to be based on both laboratory values, including lead levels, zinc protoporphyrin levels, blood counts, and other tests felt to be warranted, as well as the physician's judgment that any symptoms or findings on physical examination are a result of lead toxicity. The medical determination may be that the employee is incapable of ever safely returning to his or her former job status. The medical determination may provide additional removal time past eighteen months for some employees or specify special protective measures to be implemented.

(K) The lead standard provides for a multiple physician review in cases where the employee wishes a second opinion concerning potential lead poisoning or toxicity. If an employee wishes a second opinion, he or she can make an appointment with a physician of his or her choice. This second physician will review the findings, recommendations or determinations of the first physician and conduct any examinations, consultations or tests deemed necessary in an attempt to make a final medical determination. If the first and second physicians do not agree in their assessment they must try to resolve their differences. If they cannot reach an agreement then they must designate a third physician to resolve the dispute.

(L) The employer must provide examining and consulting physicians with the following specific information: A copy of the lead regulations and all appendices, a description of the employee's duties as related to exposure, the exposure level to lead and any other toxic substances (if applicable), a description of personal protective equipment used, blood

lead levels, and all prior written medical opinions regarding the employee in the employer's possession or control. The employer must also obtain from the physician and provide the employee with a written medical opinion containing blood lead levels, the physician's opinion as to whether the employee is at risk of material impairment to health, any recommended protective measures for the employee if further exposure is permitted, as well as any recommended limitations upon an employee's use of respirators.

(M) Employers must instruct each physician not to reveal to the employer in writing or in any other way his or her findings, laboratory results, or diagnoses which are felt to be unrelated to occupational lead exposure. They must also instruct each physician to advise the employee of any occupationally or nonoccupationally related medical condition requiring further treatment or evaluation.

(N) The standard provides for the use of respirators when engineering and other primary controls have not been fully implemented. However, the use of respirator protection shall not be used in lieu of temporary medical removal due to elevated blood lead levels or findings that an employee is at risk of material health impairment. This is based on the numerous inadequacies of respirators including skin rash where the facepiece makes contact with the skin, unacceptable stress to breathing in some workers with underlying cardiopulmonary impairment, difficulty in providing adequate fit, the tendency for respirators to create additional hazards by interfering with vision, hearing, and mobility, and the difficulties of assuring the maximum effectiveness of a complicated work practice program involving respirators. Respirators do, however, serve a useful function where engineering and work practice are inadequate by providing interim or short-term protection, provided they are properly selected for the environment in which the employee will be working, properly fitted to the employee, maintained and cleaned periodically, and worn by the employee when required.

(O) In its final standard on occupational exposure to inorganic lead, WISHA has prohibited prophylactic chelation. Diagnostic and therapeutic chelation are permitted only under the supervision of a licensed physician with appropriate medical monitoring in an acceptable clinical setting. The decision to initiate chelation therapy must be made on an individual basis and take into account the severity of symptoms felt to be a result of lead toxicity along with blood lead levels, ZPP levels and other laboratory tests as appropriate. EDTA and penicillamine, which are the primary chelating agents used in the therapy of occupational lead poisoning, have significant potential side effects and their use must be justified on the basis of expected benefits to the worker.

(P) Unless frank and severe symptoms are present, therapeutic chelation is not recommended given the opportunity to remove a worker from exposure and allow the body to naturally excrete accumulated lead. As a diagnostic aid, the chelation mobilization test using CA-EDTA has limited applicability. According to some investigators, the tests can differentiate between lead-induced and other nephropathies. The test may also provide an estimation of the mobile fraction of the total body lead burden.

(Q) Employers are required to assure that accurate records are maintained on exposure monitoring, medical surveillance, and medical removal for each employee. Exposure monitoring and medical surveillance records must be kept for forty years or the duration of employment plus twenty years, whichever is longer, while medical removal records must be maintained for the duration of employment. All records required under the standard must be made available upon request to representatives of the director of the department of labor and industries. Employers must also make environmental and biological monitoring and medical removal records available to affected employees and to former employees or their authorized employee representatives. Employees or their specifically designated representatives have access to their entire medical surveillance records.

(R) In addition, the standard requires that the employer inform all workers exposed to lead at or above the action level of the provisions of the standard and all its appendices, the purpose and description of medical surveillance and provisions for medical removal protection if temporary removal is required. An understanding of the potential health effects of lead exposure by all exposed employees along with full understanding of their rights under the lead standard is essential for an effective monitoring program.

(iii) Adverse health effects of inorganic lead.

(A) Although the toxicity of lead has been known for 2,000 years, the knowledge of the complex relationship between lead exposure and human response is still being refined. Significant research into the toxic properties of lead continues throughout the world, and it should be anticipated that our understanding of thresholds of effects and margins of safety will be improved in future years. The provisions of the lead standard are founded on two prime medical judgments; first, the prevention of adverse health effects from exposure to lead throughout a working lifetime requires that worker blood lead levels be maintained at or below 40 $\mu\text{g}/100\text{g}$, and second, the blood lead levels of workers, male or female, who intend to parent in the near future should be maintained below 30 $\mu\text{g}/100\text{g}$ to minimize adverse reproduction health effects to the parent and developing fetus. The adverse effects of lead on reproduction are being actively researched and WISHA encourages the physician to remain abreast of recent developments in the area to best advise pregnant workers or workers planning to conceive children.

(B) The spectrum of health effects caused by lead exposure can be sub-divided into five developmental states; normal, physiological changes of uncertain significance, pathophysiological changes, overt symptoms (morbidity), and mortality. Within this process there are no sharp distinctions, but rather a continuum of effects. Boundaries between categories overlap due to the wide variation of individual responses [responses] and exposures in the working population. WISHA's development of the lead standard focused on pathophysiological changes as well as later stages of disease.

(I) Heme synthesis inhibition.

a) The earliest demonstrated effect of lead involves its ability to inhibit at least two enzymes [enzymes] of the heme synthesis pathway at very low blood levels. Inhibition of delta aminolevulinic acid dehydrase (ALA-D) which catalyzes the conversion of delta-aminolevulinic acid (ALA) to protoporphyrin is observed at a blood lead level below 20 $\mu\text{g}/100\text{g}$ whole blood. At a blood lead level of 40

$\mu\text{g}/100\text{g}$, more than twenty percent of the population would have seventy percent inhibition of ALA-D. There is an exponential increase in ALA excretion at blood lead levels greater than 40 $\mu\text{g}/100\text{g}$.

b) Another enzyme, ferrochelatase, is also inhibited at low blood lead levels. Inhibition of ferrochelatase leads to increased free erythrocyte protoporphyrin (FEP) in the blood which can then bind to zinc to yield zinc protoporphyrin. At a blood lead level of 50 $\mu\text{g}/100\text{g}$ or greater, nearly 100 percent of the population will have an increase FEP. There is also an exponential relationship between blood lead levels greater than 40 $\mu\text{g}/100\text{g}$ and the associated ZPP level, which has led to the development of the ZPP screening test for lead exposure.

c) While the significance of these effects is subject to debate, it is WISHA's position that these enzyme disturbances are early stages of a disease process which may eventually result in the clinical symptoms of lead poisoning. Whether or not the effects do progress to the later stages of clinical disease, disruption of these enzyme processes over a working lifetime is considered to be a material impairment of health.

d) One of the eventual results of lead-induced inhibition of enzymes in the heme synthesis pathway is anemia which can be asymptomatic if mild but associated with a wide array of symptoms including dizziness, fatigue, and tachycardia when more severe. Studies have indicated that lead levels as low as 50 $\mu\text{g}/100\text{g}$ can be associated with a definite decreased hemoglobin, although most cases of lead-induced anemia, as well as shortened red-cell survival times, occur at lead levels exceeding 80 $\mu\text{g}/100\text{g}$. Inhibited hemoglobin synthesis is more common in chronic cases whereas shortened erythrocyte life span is more common in acute cases.

e) In lead-induced anemias, there is usually a reticulocytosis along with the presence of basophilic stippling, and ringed sideroblasts, although none of the above are pathognomonic for lead-induced anemia.

(II) Neurological effects.

a) Inorganic lead had been found to have toxic effects on both the central and peripheral nervous systems. The earliest stage of lead-induced central nervous system effects first manifest themselves in the form of behavioral disturbances and central nervous system symptoms including irritability, restlessness, insomnia and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. With more severe exposure, symptoms can progress to drowsiness, stupor, hallucinations, delirium, convulsions and coma.

b) The most severe and acute form of lead poisoning which usually follows ingestion or inhalation of large amounts of lead is acute encephalopathy which may arise precipitously with the onset of intractable seizures, coma, cardiorespiratory arrest, and death within 48 hours.

c) While there is disagreement about what exposure levels are needed to produce the earliest symptoms, most experts agree that symptoms definitely can occur at blood lead levels of 60 $\mu\text{g}/100\text{g}$ whole blood and therefore recommend a 40 $\mu\text{g}/100\text{g}$ maximum. The central nervous system effects frequently are not reversible following discontinued exposure or chelation therapy and when improvement does occur, it is almost always only partial.

d) The peripheral neuropathy resulting from lead exposure characteristically involves only motor function with minimal sensory damage and has a marked predilection for the extensor muscles of the most active extremity. The peripheral neuropathy can occur with varying degrees of severity. The earliest and mildest form which can be detected in workers with blood lead levels as low as 50 $\mu\text{g}/100\text{g}$ is manifested by slowing or motor nerve conduction velocity often without clinical symptoms. With progression of the neuropathy there is development of painless extensor muscle weakness usually involving the extensor muscles of the fingers and hand in the most active upper extremity, followed in severe cases by wrist drop, much less commonly, foot drop.

e) In addition to slowing of nerve conduction, electromyographical studies in patients with blood lead levels greater than 50 $\mu\text{g}/100\text{g}$ have demonstrated a decrease in the number of acting motor unit potentials, an increase in the duration of motor unit potentials, and spontaneous pathological activity including fibrillations and fasciculation. Whether these effects occur at levels of 40 $\mu\text{g}/100\text{g}$ is undetermined.

f) While the peripheral neuropathies can occasionally be reversed with therapy, again such recovery is not assured particularly in the more severe neuropathies and often improvement is only partial. The lack of reversibility is felt to be due in part to segmental demyelination.

(III) Gastrointestinal. Lead may also effect the gastrointestinal system producing abdominal colic or diffuse abdominal pain, constipation, obstipation, diarrhea, anorexia, nausea and vomiting. Lead colic rarely develops at blood lead levels below 80 $\mu\text{g}/100\text{g}$.

(IV) Renal.

a) Renal toxicity represents one of the most serious health effects of lead poisoning. In the early stages of disease nuclear inclusion bodies can frequently be identified in proximal renal tubular cells. Renal functions remain normal and the changes in this stage are probably reversible. With more advanced disease there is progressive interstitial fibrosis and impaired renal function. Eventually extensive interstitial fibrosis ensues with sclerotic glomeruli and dilated and atrophied proximal tubules; all represent end stage kidney disease. Azotemia can be progressive, eventually resulting in frank uremia necessitating dialysis. There is occasionally associated hypertension and hyperuricemia with or without gout.

b) Early kidney disease is difficult to detect. The urinalysis is normal in early lead nephropathy and the blood urea nitrogen and serum creatinine increase only when two-thirds of kidney function is lost. Measurement of creatinine clearance can often detect earlier disease as can other methods of measurement of glomerular filtration rate. An abnormal Ca-EDTA mobilization test has been used to differentiate between lead-induced and other nephropathies, but this procedure is not widely accepted. A form of Fanconi syndrome with aminoaciduria, glycosuria, and hyperphosphaturia indicating severe injury to the proximal renal tubules is occasionally seen in children.

(V) Reproductive effects.

a) Exposure to lead can have serious effects on reproductive function in both males and females. In male workers exposed to lead there can be a decrease in sexual

drive, impotence, decreased ability to produce healthy sperm, and sterility. Malformed sperm (teratospermia), decreased number of sperm (hypospermia), and sperm with decreased motility (asthenospermia) can occur. Teratospermia has been noted at mean blood lead levels of 53 $\mu\text{g}/100\text{g}$ and hypospermia and asthenospermia at 41 $\mu\text{g}/100\text{g}$. Furthermore, there appears to be a dose-response relationship for teratospermia in lead exposed workers.

b) Women exposed to lead may experience menstrual disturbances including dysmenorrhea, menorrhagia and amenorrhea. Following exposure to lead, women have a higher frequency of sterility, premature births, spontaneous miscarriages, and stillbirths.

c) Germ cells can be affected by lead and cause genetic damage in the egg or sperm cells before conception and result in failure to implant, miscarriage, stillbirth, or birth defects.

d) Infants of mothers with lead poisoning have a higher mortality during the first year and suffer from lowered birth weights, slower growth, and nervous system disorders.

e) Lead can pass through the placental barrier and lead levels in the mother's blood are comparable to concentrations of lead in the umbilical cord at birth. Transplacental passage becomes detectable at 12-14 weeks of gestation and increases until birth.

f) There is little direct data on damage to the fetus from exposure to lead but it is generally assumed that the fetus and newborn would be at least as susceptible to neurological damage as young children. Blood lead levels of 50-60 $\mu\text{g}/100\text{g}$ in children can cause significant neurobehavioral impairments, and there is evidence of hyperactivity at blood levels as low as 25 $\mu\text{g}/100\text{g}$. Given the overall body of literature concerning the adverse health effects of lead in children, WISHA feels that the blood lead level in children should be maintained below 30 $\mu\text{g}/100\text{g}$ with a population mean of 15 $\mu\text{g}/100\text{g}$. Blood lead levels in the fetus and newborn likewise should not exceed 30 $\mu\text{g}/100\text{g}$.

g) Because of lead's ability to pass through the placental barrier and also because of the demonstrated adverse effects of lead on reproductive function in both males and females as well as the risk of genetic damage of lead on both the ovum and sperm, WISHA recommends a 30 $\mu\text{g}/100\text{g}$ maximum permissible blood lead level in both males and females who wish to bear children.

(IV) Other toxic effects.

a) Debate and research continue on the effects of lead on the human body. Hypertension has frequently been noted in occupationally exposed individuals although it is difficult to assess whether this is due to lead's adverse effects on the kidneys or if some other mechanism is involved.

b) Vascular and electrocardiographic changes have been detected but have not been well characterized. Lead is thought to impair thyroid function and interfere with the pituitary-adrenal axis, but again these effects have not been well defined.

(iv) Medical evaluation.

(A) The most important principle in evaluating a worker for any occupational disease including lead poisoning is a high index of suspicion on the part of the examining physician. As discussed in Section (ii), lead can affect numerous organ systems and produce a wide array of signs

and symptoms, most of which are nonspecific and subtle in nature at least in the early stages of disease. Unless serious concern for lead toxicity is present, many of the early clues to diagnosis may easily be overlooked.

(B) The crucial initial step in the medical evaluation is recognizing that a worker's employment can result in exposure to lead. The worker will frequently be able to define exposures to lead and lead-containing materials but often will not volunteer this information unless specifically asked. In other situations the worker may not know of any exposures to lead but the suspicion might be raised on the part of the physician because of the industry or occupation of the worker. Potential occupational exposure to lead and its compounds occur in at least 120 occupations, including lead smelting, the manufacture of lead storage batteries, the manufacture of lead pigments and products containing pigments, solder manufacture, shipbuilding and ship repair, auto manufacturing, construction, and painting.

(C) Once the possibility for lead exposure is raised, the focus can then be directed toward eliciting information from the medical history, physical exam, and finally from laboratory data to evaluate the worker for potential lead toxicity.

(D) A complete and detailed work history is important in the initial evaluation. A listing of all previous employment with information on work processes, exposure to fumes or dust, known exposures to lead or other toxic substances, respiratory protection used, and previous medical surveillance should all be included in the worker's record. Where exposure to lead is suspected, information concerning on-the-job personal hygiene, smoking or eating habits in work areas, laundry procedures, and use of any protective clothing or respiratory protection equipment should be noted. A complete work history is essential in the medical evaluation of a worker with suspected lead toxicity, especially when long-term effects such as neurotoxicity and nephrotoxicity are considered.

(E) The medical history is also of fundamental importance and should include a listing of all past and current medical conditions, current medications including proprietary drug intake, previous surgeries and hospitalizations, allergies, smoking history, alcohol consumption, and also nonoccupational lead exposures such as hobbies (hunting, riflery). Also known childhood exposures should be elicited. Any previous history of hematological, neurological, gastrointestinal, renal, psychological, gynecological, genetic, or reproductive problems should be specifically noted.

(F) A careful and complete review of systems must be performed to assess both recognized complaints and subtle or slowly acquired symptoms which the worker might not appreciate as being significant. The review of symptoms should include the following:

General	-	weight loss, fatigue, decreased appetite.
Head, Eyes, Ears, Nose, Throat (HEENT)	-	headaches, visual disturbance or decreased visual acuity, hearing deficits or tinnitus, pigmentation of the oral mucosa, or metallic taste in mouth.
Cardio-pulmonary	-	shortness of breath, cough, chest pains, palpitations, or orthopnea.

Gastrointestinal	-	nausea, vomiting, heartburn, abdominal pain, constipation or diarrhea.
Neurologic	-	irritability, insomnia, weakness (fatigue), dizziness, loss of memory, confusion, hallucinations, incoordination, ataxia, decreased strength in hands or feet, disturbance in gait, difficulty in climbing stairs, or seizures.
Hematologic	-	pallor, easy fatigability, abnormal blood loss, melena.
Reproductive (male or female and spouse where relevant)	-	history of infertility, impotence, loss of libido, abnormal menstrual periods, history of miscarriages, stillbirths, or children with birth defects.
Musculo-skeletal	-	muscle and joint pains.

(G) The physical examination should emphasize the neurological, gastrointestinal, and cardiovascular systems. The worker's weight and blood pressure should be recorded and the oral mucosa checked for pigmentation characteristic of a possible Burtonian or lead line on the gingiva. It should be noted, however, that the lead line may not be present even in severe lead poisoning if good oral hygiene is practiced.

(H) The presence of pallor on skin examination may indicate an anemia, which if severe might also be associated with a tachycardia. If an anemia is suspected, an active search for blood loss should be undertaken including potential blood loss through the gastrointestinal tract.

(I) A complete neurological examination should include an adequate mental status evaluation including a search for behavioral and psychological disturbances, memory testing, evaluation for irritability, insomnia, hallucinations, and mental clouding. Gait and coordination should be examined along with close observation for tremor. A detailed evaluation of peripheral nerve function including careful sensory and motor function testing is warranted. Strength testing particularly of extensor muscle groups of all extremities is of fundamental importance.

(J) Cranial nerve evaluation should also be included in the routine examination.

(K) The abdominal examination should include auscultation for bowel sounds and abnormal bruits and palpation for organomegaly, masses, and diffuse abdominal tenderness.

(L) Cardiovascular examination should evaluate possible early signs of congestive heart failure. Pulmonary status should be addressed particularly if respirator protection is contemplated.

(M) As part of the medical evaluation, the lead standard requires the following laboratory studies.

(I) Blood lead level.

(II) Hemoglobin and hematocrit determinations, red cell indices, and examination of the peripheral blood smear to evaluate red blood cell morphology.

(III) Blood urea nitrogen.

(IV) Serum creatinine.

(V) Routine urinalysis with microscopic examination.

(VI) A zinc protoporphyrin level.

(N) In addition to the above, the physician is authorized to order any further laboratory or other tests which he or she deems necessary in accordance with sound medical practice. The evaluation must also include pregnancy testing or laboratory evaluation of male fertility if requested by the employee.

(O) Additional tests which are probably not warranted on a routine basis but may be appropriate when blood lead and ZPP levels are equivocal include delta aminolevulinic acid and coproporphyrin concentrations in the urine, and dark-field illumination for detection of basophilic stippling in red blood cells.

(P) If an anemia is detected further studies including a careful examination of the peripheral smear, reticulocyte count, stool for occult blood, serum iron, total iron binding capacity, bilirubin, and, if appropriate vitamin B12 and folate may be of value in attempting to identify the cause of the anemia.

(Q) If a peripheral neuropathy is suspected, nerve conduction studies are warranted both for diagnosis and as a basis to monitor any therapy.

(R) If renal disease is questioned, a 24-hour urine collection for creatinine clearance, protein, and electrolytes may be indicated. Elevated uric acid levels may result from lead-induced renal disease and a serum uric acid level might be performed.

(S) An electrocardiogram and chest x-ray may be obtained as deemed appropriate.

(T) Sophisticated and highly specialized testing should not be done routinely and where indicated should be under the direction of a specialist.

(v) Laboratory evaluation.

(A) The blood level at present remains the single most important test to monitor lead exposure and is the test used in the medical surveillance program under the lead standard to guide employee medical removal. The ZPP has several advantages over the blood lead level. Because of its relatively recent development and the lack of extensive data concerning its interpretation, the ZPP currently remains an ancillary test.

(B) This section will discuss the blood lead level and ZPP in detail and will outline their relative advantages and disadvantages. Other blood tests currently available to evaluate lead exposure will also be reviewed.

(C) The blood lead level is a good index of current or recent lead absorption when there is no anemia present and when the worker has not taken any chelating agents. However, blood lead levels along with urinary lead levels do not necessarily indicate the total body burden of lead and are not adequate measures of past exposure. One reason for this is that lead has a high affinity for bone and up to 90 percent of the body's total lead is deposited there. A very important component of the total lead body burden is lead in soft tissue (liver, kidneys, and brain). This fraction of the lead body burden, the biologically active lead, is not entirely reflected by blood lead levels since it is a function of the dynamics of lead absorption, distribution, deposition in bone and excretion. Following discontinuation of exposure to lead, the excess body burden is only slowly mobilized from bone and other relatively stable stores and excreted. Consequently, a

high blood lead level may only represent recent heavy exposure to lead without a significant total body excess and likewise a low blood lead level does not exclude an elevated total body burden of lead.

(D) Also due to its correlation with recent exposures, the blood lead level may vary considerably over short time intervals.

(E) To minimize laboratory error and erroneous results due to contamination, blood specimens must be carefully collected after thorough cleaning of the skin with appropriate methods using lead-free containers and analyzed by a reliable laboratory. Under the standard, samples must be analyzed in laboratories which are approved by the Center for Disease Control (CDC) or which have received satisfactory grades in proficiency testing by the CDC in the previous year. Analysis is to be made using atomic absorption spectrophotometry anodic stripping; voltammetry or any method which meets the accuracy requirements set forth by the standard.

(F) The determination of lead in urine is generally considered a less reliable monitoring technique than analysis of whole blood primarily due to individual variability in urinary excretion capacity as well as the technical difficulty of obtaining accurate 24 hour urine collections. In addition, workers with renal insufficiency, whether due to lead or some other cause, may have decreased lead clearance and consequently urine lead levels may underestimate the true lead burden. Therefore, urine lead levels should not be used as a routine test.

(G) The zinc protoporphyrin test, unlike the blood lead determination, measures an adverse metabolic effect of lead and as such is a better indicator of lead toxicity than the level of blood lead itself. The level of ZPP reflects lead absorption over the preceding three to four months, and therefore is a better indicator of lead body burden. The ZPP requires more time than the blood lead to read significantly elevated levels; the return to normal after discontinuing lead exposure is also slower. Furthermore, the ZPP test is simpler, faster, and less expensive to perform and no contamination is possible. Many investigators believe it is the most reliable means of monitoring chronic lead absorption.

(H) Zinc protoporphyrin results from the inhibition of the enzyme ferrochelatase which catalyzes the insertion of an iron molecule into the protoporphyrin molecule, which then becomes heme. If iron is not inserted into the molecule then zinc, having a greater affinity for protoporphyrin, takes place in the iron, forming ZPP.

(I) An elevation in the level of circulating ZPP may occur at blood lead levels as low as 20-30 $\mu\text{g}/100\text{g}$ in some workers. Once the blood lead level has reached 40 $\mu\text{g}/100\text{g}$ there is more marked rise in the ZPP value from its normal range of less than 100 $\mu\text{g}/100\text{ml}$. Increases in blood lead levels beyond 40 $\mu\text{g}/100\text{g}$ are associated with exponential increases in ZPP.

(J) Whereas blood lead levels fluctuate over short time spans, ZPP levels remain relatively stable. ZPP is measured directly in red blood cells and is present for the cell's entire 120 day lifespan. Therefore, the ZPP level in blood reflects the average ZPP production over the previous three to four months and consequently the average lead exposure during that time interval.

(K) It is recommended that a hematocrit be determined whenever a confirmed ZPP of 50 µg/100ml whole blood is obtained to rule out a significant underlying anemia. If the ZPP is in excess of 100µg/100ml and not associated with abnormal elevations in blood lead levels, the laboratory should be checked to be sure the blood leads were determined using atomic absorption spectrophotometry, anodic stripping voltammetry or any method which meets the accuracy requirements set forth by the standard, by a CDC approved laboratory which is experienced in lead level determinations. Repeat periodic blood lead studies should be obtained in all individuals with elevated ZPP levels to be certain that an associated elevated blood lead level has not been missed due to transient fluctuations in blood leads.

(L) ZPP has characteristic fluorescence spectrum with a peak at 594nm which is detectable with a hematofluorimeter. The hematofluorimeter is accurate and portable and can provide on-site, instantaneous results for workers who can be frequently tested via a finger prick.

(M) However, careful attention must be given to calibration and quality control procedures. Limited data on blood lead - ZPP correlations and the ZPP levels which are associated with the adverse health effects discussed in item (ii) are the major limitations of the test. Also it is difficult to correlate ZPP levels with environmental exposure and there is some variation of response with age and sex. Nevertheless, the ZPP promises to be an important diagnostic test for the early detection of lead toxicity and its value will increase as more data is collected regarding its relationship to other manifestations of lead poisoning.

(N) Levels of delta-aminolevulinic acid (ALA) in the urine are also used as a measure of lead exposure. Increasing concentrations of ALA are believed to result from the inhibition of the enzyme delta-aminolevulinic acid dehydrase (ALA-D). Although the test is relatively easy to perform, inexpensive, and rapid, the disadvantages include variability in results, the necessity to collect a complete 24 hour urine sample which has a specific gravity greater than 1.010, and also the fact that ALA decomposes in the presence of light.

(O) The pattern of porphyrin excretion in the urine can also be helpful in identifying lead intoxication. With lead poisoning, the urine concentrations of coproporphyrins I and II, porphobilinogen and uroporphyrin I rise. The most important increase, however, is that of coproporphyrin III; levels may exceed 5,000 µg/l in the urine in lead poisoned individuals, but its correlation with blood lead levels and ZPP are not as good as those of ALA. Increases in urinary porphyrins are not diagnostic of lead toxicity and may be seen in porphyria, some liver diseases, and in patients with high reticulocyte counts.

(vi) Summary.

(A) The WISHA standard for inorganic lead places significant emphasis on the medical surveillance of all workers exposed to levels of inorganic lead above the action level of 30 µg/m³ TWA. The physician has a fundamental role in this surveillance program, and in the operation of the medical removal protection program.

(B) Even with adequate worker education on the adverse health effects of lead and appropriate training in work practices, personal hygiene and other control measures, the physician has a primary responsibility for evaluating potential lead toxicity in the worker. It is only through a careful

and detailed medical and work history, a complete physical examination and appropriate laboratory testing that an accurate assessment can be made. Many of the adverse health effects of lead toxicity are either irreversible or only partially reversible and therefore early detection of disease is very important.

(C) This document outlines the medical monitoring program as defined by the occupational safety and health standard for inorganic lead. It reviews the adverse health effects of lead poisoning and describes the important elements of the history and physical examinations as they relate to these adverse effects.

(D) It is hoped that this review and discussion will give the physician a better understanding of the WISHA standard with the ultimate goal of protecting the health and well-being of the worker exposed to lead under his or her care.

(d) Appendix D. Qualitative Fit Test Protocols. This appendix specifies the only allowable qualitative fit test (QLFT) protocols permissible for compliance with WAC 296-62-07521 (7)(c)(ii).

(i) Isoamyl acetate protocol.

(A) Odor threshold screening.

(I) Three 1-liter glass jars with metal lids (e.g., Mason or Ball jars) are required.

(II) Odor-free water (e.g., distilled or spring water) at approximately 25° C shall be used for the solutions.

(III) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 cc of pure IAA to 800 cc of odor-free water in a 1-liter jar and shaking for 30 seconds. This solution shall be prepared new at least weekly.

(IV) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well ventilated but may not be connected to the same recirculating ventilation system.

(V) The odor test solution is prepared in a second jar by placing .4 cc of the stock solution into 500 cc of odor-free water using a clean dropper or pipette. Shake for 30 seconds and allow to stand two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution may be used for only one day.

(VI) A test blank is prepared in a third jar by adding 500 cc of odor-free water.

(VII) The odor test and test blank jars shall be labeled 1 and 2 for jar identification. If the labels are put on the lids they can be periodically dried off and switched to avoid people thinking the same jars always has the IAA.

(VIII) The following instructions shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2); "The purpose of this test is to determine if you can smell banana oil at low concentrations. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(IX) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(X) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA QLFT may not be used.

(XI) If the test subject correctly identifies the jar containing the odor test solution he or she may proceed to respirator selection and fit testing.

(B) Respirator selection.

(I) The test subject shall be allowed to select the most comfortable respirator from a large array of various sizes and manufacturers that includes at least three sizes of elastomeric half facepieces and units of at least two manufacturers.

(II) The selection process shall be conducted in a room separate from the fit-test chamber to prevent odor fatigue. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to assess a "comfortable" respirator. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This may not constitute formal training on respirator use, only a review.

(III) The test subject should understand that he or she is being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape and, if fit properly, will provide adequate protection.

(IV) The test subject holds each facepiece up to his or her face and eliminates those which are obviously not giving a comfortable fit. Normally, selection will begin with a half-mask and if a fit cannot be found here, the subject will be asked to go to the full facepiece respirators. (A small percentage of users will not be able to wear any half-masks.)

(V) The more comfortable facepieces are recorded; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in (VI) below. If the test subject is not familiar with using a particular respirator, he or she shall be directed to don the mask several times and to adjust the straps each time, so that he or she becomes adept at setting proper tension on the straps.

(VI) Assessment of comfort shall include reviewing the following points with the test subject:

- Chin properly placed.
- Positioning of mask on nose.
- Strap tension.
- Fit across nose bridge.
- Room for safety glasses.
- Distance from nose to chin.
- Room to talk.
- Tendency to slip.
- Cheeks filled out.
- Self-observation/in mirror.
- Adequate time for assessment.

(VII) The test subject shall conduct the conventional negative and positive-pressure fit checks (e.g., see ANSI Z88.2-1980). Before conducting the negative or positive-pressure checks, the subject shall be told to "seat" his or her mask by rapidly moving the head side-to-side and up and down, taking a few deep breaths.

(VIII) The test subject is now ready for fit testing.

(IX) After passing the fit test, the test subjects shall be questioned again regarding the comfort of the respirator. If it has become uncomfortable, another model of respirator shall be tried.

(X) The employee shall be given the opportunity to select a different facepiece and be retested if during the first two weeks of on-the-job wear, the chosen facepiece becomes unacceptably uncomfortable.

(C) Fit test.

(I) The fit test chamber shall be substantially similar to a clear 55 gallon drum liner suspended inverted over a two foot diameter frame, so that the top of the chamber is about six inches above the test subject's head. The inside top center of the chamber shall have a small hook attached.

(II) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors. The cartridges or masks shall be changed at least weekly.

(III) After selecting, donning, and properly adjusting a respirator himself or herself, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab hook, to prevent general room contamination.

(IV) A copy of the following test exercises and rainbow (or equally effective) passage shall be taped to the inside of the test chamber:

- a) Normal breathing.
- b) Deep breathing. Be certain breaths are deep and regular.
- c) Turning head from side-to-side. Be certain movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have the test subject inhale when his or her head is at either side.
- d) Nodding head up-and-down. Be sure certain motions are complete and made about every second. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his or her head is in the fully up position.

e) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

Rainbow Passage. When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

f) Normal breathing.

(V) Each test subject shall wear his or her respirator for at least ten minutes before starting the fit test.

(VI) Upon entering the test chamber, the test subject shall be given a six inch by five inch piece of paper towel or other porous absorbent single ply material, folded in half and wetted with three-quarters of one cc of pure IAA. The

test subject will hang the wet towel on the hook at the top of the chamber.

(VII) Allow two minutes for the IAA test concentration to be reached before starting the fit-test exercises. This would be an appropriate time to talk with the test subject, to explain the fit test, the importance of his or her cooperation, the purpose of the head exercises, or to demonstrate some of the exercises.

(VIII) Each exercise described in segment (IV) above shall be performed for at least one minute.

(IX) If at any time during the test, the subject detects the banana-like odor of IAA, he or she shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(X) Upon returning to the selection room, the subject shall remove the respirator, repeat the odor sensitivity test, select and put on another respirator, return to the test chamber, etc. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait about 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

(XI) If a person cannot be fitted with the selection of half-mask respirators, include full facepiece models in the selection process. When a respirator is found that passes the test, its efficiency shall be demonstrated for the subject by having him break the face seal and take a breath before exiting the chamber.

(XII) When the test subject leaves the chamber he or she shall remove the saturated towel, returning it to the test conductor. To keep the area from becoming contaminated, the used towels shall be kept in a self-sealing bag. There is no significant IAA concentration buildup in the test chamber from subsequent tests.

(XIII) Persons who have successfully passed this fit test may be assigned the use of the tested respirator in atmospheres with up to ten times the PEL of airborne lead. In other words this IAA protocol may be used to assign a protection factor no higher than ten.

(ii) Saccharin solution aerosol protocol.

(A) Taste threshold screening.

(I) Threshold screening as well as fit testing employees shall use an enclosure about the head and shoulders that is approximately twelve inches in diameter by fourteen inches tall with at least the front portion clear and that allows free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly of part #FT 14 and FT 15 combined is adequate.

(II) The test closure shall have a three-quarter inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(III) The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(IV) The test subject shall don the test enclosure. For the threshold screening test, he or she shall breathe through his or her open mouth with tongue extended.

(V) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(VI) The threshold check solution consists of 0.83 grams of sodium saccharin, USP water. It can be prepared by putting 1 cc of the test solution (see (C)(VI) below) in 100 cc of water.

(VII) To produce the aerosol the nebulizer bulb is firmly squeezed so that it collapses completely, then is released and allowed to fully expand.

(VIII) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.

(IX) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(X) If the second response is negative ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(XI) The test conductor will take note of the number of squeezes required to elicit a taste response.

(XII) If the saccharin is not tasted after thirty squeezes (Step (A)(IX)) the test subject may not perform the saccharin fit test.

(XIII) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(XIV) Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

(XV) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(B) Respirator selection. Respirators shall be selected as described in Section (i)(B) above, except that each respirator shall be equipped with a particulate filter cartridge.

(C) Fit test.

(I) The fit test uses the same enclosure described in (i)(B)(I) and (II) above.

(II) Each test subject shall wear his or her respirator for at least ten minutes before starting the fit test.

(III) The test subject shall don the enclosure while wearing the respirator selected on Section (A) above. The respirator shall be properly adjusted and equipped with a particulate filter cartridge.

(IV) The test subject may not eat, drink (except plain water), or chew gum for fifteen minutes before the test.

(V) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(VI) The first test solution is prepared by adding 83 grams of sodium saccharin to 100 cc of warm water.

(VII) As before, the test subject shall breathe through the open mouth with tongue extended.

(VIII) The nebulizer is inserted into the hole in the front of the enclosure and the fit test solution is sprayed into the enclosure using the same technique as for the taste threshold screening and the same number of squeezes required to elicit a taste response in the screening. (See (A)(X) above.)

(IX) After generation of the aerosol the test subject shall be instructed to perform the following exercises for one minute each.

a) Normal breathing.

b) Deep breathing. Be certain breaths are deep and regular.

c) Turning head from side-to-side. Be certain movement is complete. Alert the test subject not to bump the

respirator on the shoulders. Have the test subject inhale when his or her head is at either side.

d) Nodding head up-and-down. Be certain motions are complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his or her head is in the fully up position.

e) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

Rainbow Passage. When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(X) Every thirty seconds, the aerosol concentration shall be replenished using one-half the number of squeezes as initially (C)(VIII).

(XI) The test subject shall so indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

(XII) If the saccharin is detected the fit is deemed unsatisfactory and a different respirator shall be tried.

(XIII) Successful completion of the test protocol shall allow the use of the tested respirator in contaminated atmospheres up to ten times the PEL. In other words this protocol may be used to assign protection factors no higher than ten.

(iii) Irritant fume protocol.

(A) Respirator Selection. Respirators shall be selected as described in Section (i)(B) above, except that each respirator shall be equipped with high efficiency cartridges.

(B) Fit Test.

(I) The test subject shall be allowed to smell a weak concentration of the irritant smoke to familiarize him or her with its characteristic odor.

(II) The test subject shall properly don the respirator selected as above, and wear it for at least ten [ten] minutes before starting the fit test.

(III) The test conductor shall review this protocol with the test subject before testing.

(IV) The test subject shall perform the conventional positive pressure and negative pressure fit checks. Failure of either check shall be cause to select an alternate respirator.

(V) Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low pressure air pump set to deliver 200 milliliters per minute.

(VI) Advise the subject that the smoke can be irritating to the eyes and instruct him or her to keep his or her eyes closed while the test is performed.

(VII) The test conductor shall direct the stream of irritant smoke from the tube toward the facesal area of the

test subject. The conductor shall begin at least twelve inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

(VIII) The following exercises shall be performed while the respirator seal is being challenged by the smoke. Each shall be performed for one minute.

a) Normal breathing.

b) Deep breathing. Be certain breaths are deep and regular.

c) Turning head from side-to-side. Be certain movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have the test subject inhale when his or her head is at either side.

d) Nodding head up-and-down. Be certain motions are complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his or her head is in the fully up position.

e) Talking—slowly and distinctly, count backwards from 100.

f) Normal breathing.

(IX) If the irritant smoke produces an involuntary reaction (cough) by the test subject, the test conductor shall stop the test. In this case the tested respirator is rejected and another respirator shall be selected.

(X) Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube to determine whether he or she reacts to the smoke. Failure to evoke a response shall void the test.

(XI) Steps (B)(IV), (VII), and (VIII) of this protocol shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the irritant smoke.

(XII) Respirators successfully tested by the protocol may be used in contaminated atmospheres up to ten times the PEL. In other words this protocol may be used to assign protection factors not exceeding ten.

(e) Appendix E: Recommendations to employers concerning high-risk tasks (nonmandatory).

The department advises employers that the following tasks have a high risk for lead overexposure (this list is not complete; other tasks also can result in lead over-exposure):

- Any open flame operation involving lead-containing solder in a manner producing molten solder, including the manufacture or repair of motor vehicle radiators;
- Sanding, cutting or grinding of lead-containing solder;
- Breaking, recycling or manufacture of lead-containing batteries;
- Casting objects using lead, brass, or lead-containing alloys;
- Where lead-containing coatings or paints are present:
 - abrasive blasting
 - welding
 - cutting
 - torch burning
 - manual demolition of structures
 - manual scraping
 - manual sanding

- heat gun applications
- power tool cleaning
- rivet busting
- clean-up activities where dry expendable abrasives are used
- abrasive blasting enclosure movement and removal;
- Spray-painting with lead-containing paint;
- Using lead-containing mortar;
- Lead burning;
- Operation or cleaning of shooting facilities where lead bullets are used;
- Formulation or processing of lead-containing pigments or paints;
- Cutting, burning, or melting of lead-containing materials.

The department recommends that annual blood lead testing be offered to all employees potentially overexposed to lead, including those performing the tasks listed above, regardless of air lead levels. Research has shown that air lead levels often do not accurately predict workers' lead overexposure. The blood lead testing will provide the most information if performed during a period of peak lead exposure.

Employers should be aware that the United States Public Health Service has set a goal of eliminating occupational exposures which result in whole blood lead levels of 25 µg/dl or greater. This goal should guide whether employees' blood lead levels indicate lead overexposure.

If blood lead levels are elevated in an employee performing a task associated with lead overexposure, employers should assess the maintenance and effectiveness of exposure controls, hygiene facilities, respiratory protection program, the employee's work practices and personal hygiene, and the employee's respirator use, if any. If a deficiency exists in any of these areas, the employer should correct the problem.

[Statutory Authority: Chapter 49.17 RCW. 95-04-078, § 296-62-07521, filed 1/30/95, effective 3/2/95; 91-24-017 (Order 91-07), § 296-62-07521, filed 11/22/91, effective 12/24/91; 90-17-051 (Order 90-10), § 296-62-07521, filed 8/13/90, effective 9/24/90; 90-03-029 (Order 89-20), § 296-62-07521, filed 1/11/90, effective 2/26/90; 88-14-108 (Order 88-11), § 296-62-07521, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-07521, filed 11/30/83; 82-13-045 (Order 82-22), § 296-62-07521, filed 6/11/82. Formerly WAC 296-62-07349.]

WAC 296-62-07711 Regulated areas. (1) General. The employer shall establish a regulated area in work areas where airborne concentrations of asbestos exceed or can reasonably be expected to exceed the permissible exposure limits prescribed in WAC 296-62-07705.

(2) Demarcation. The regulated area shall be demarcated in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos in excess of the permissible exposure limits.

(3) Access. Access to regulated areas shall be limited to authorized persons or to persons authorized by the Washington Industrial Safety and Health Act or regulations issued pursuant thereto.

(4) Provision of respirators. Each person entering a regulated area shall be supplied with and required to use a respirator, selected in accordance with WAC 296-62-07715.

(5) Protective clothing. All persons entering a regulated area shall be supplied with and required to wear protective clothing, selected in accordance with WAC 296-62-07717.

(6) Prohibited activities. The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated areas.

(7) Permit-required confined space. The employer shall determine if a permit-required confined space hazard exists and shall take any necessary precautions in accordance with chapter 296-62 WAC Part M.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-07711, filed 1/18/95, effective 3/1/95; 93-19-142 (Order 93-04), § 296-62-07711, filed 9/22/93, effective 11/1/93; 89-11-035 (Order 89-03), § 296-62-07711, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07711, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07711, filed 4/27/87.]

WAC 296-62-11001 Definition. Ventilation shall mean the provision, circulation or exhausting of air into or from an area or space.

(1) "Local exhaust ventilation" shall mean the mechanical removal of contaminated air from the point where the contaminant is being generated or liberated.

(2) "Dilution ventilation" means inducing and mixing uncontaminated air with contaminated air in such quantities that the resultant mixture in the breathing zone will not exceed the permissible exposure limit (PEL) specified for any contaminant.

(3) "Exhaust ventilation" means the general movement of air out of the area or permit-required confined space by mechanical or natural means.

(4) "Tempered makeup air" means air which has been conditioned by changing its heat content to obtain a specific desired temperature.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-11001, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-62-11001, filed 11/13/80; Order 73-3, § 296-62-11001, filed 5/7/73.]

WAC 296-62-145 Permit-required confined spaces.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-145, filed 1/18/95, effective 3/1/95; Order 73-3, § 296-62-145 reference section, filed 5/7/73.]

WAC 296-62-14500 Scope and application. (1) Scope. This part contains minimum requirements for practices and procedures to protect employees in all industries from the hazards of entry and/or work in permit-required confined spaces.

(2) Application. Part M (Permit-required confined spaces) applies to all employers under the jurisdiction of the Washington Industrial Safety and Health Act, chapter 49.17 RCW. Part M may be augmented by more protective requirements for confined spaces or areas in vertical standards. Certain industry specific vertical standards are more protective than chapter 296-62 WAC, Part M. Where there is a conflict between an industry specific vertical standard

and chapter 296-62 WAC, Part M, the vertical standard shall apply.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14500, filed 1/18/95, effective 3/1/95.]

WAC 296-62-14501 Definitions. **Acceptable entry conditions** means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

Attendant means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

Authorized entrant means an employee who is authorized by the employer to enter a permit space.

Blanking or blinding means the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined space means a space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- (2) Has limited or restricted means for entry or exit (For example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and

- (3) Is not designed for continuous employee occupancy.

Double block and bleed means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry permit (permit) means the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in WAC 296-62-14509.

Entry supervisor means the person (such as the employer, crew leader, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this part.

Note: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also,

the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

Hazardous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

- (1) Flammable gas, vapor, or mist in excess of ten percent of its lower flammable limit (LFL);
- (2) Airborne combustible dust at a concentration that meets or exceeds its LFL;

Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet (1.52 m) or less.

- (3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

- (4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in chapter 296-62 WAC, general occupational health standards, and which could result in employee exposure in excess of its dose or permissible exposure limit;

Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

- (5) Any other atmospheric condition that is immediately dangerous to life or health.

Note: For air contaminants for which WISHA has not determined a dose or permissible exposure limit, other sources of information, such as material safety data sheets that comply with the Hazard Communication Standard, chapter 296-62 WAC, Part C, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot work permit means the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

Immediately dangerous to life or health (IDLH) means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Note: Some materials - hydrogen fluoride gas and cadmium vapor, for example - may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

Inerting means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

Note: This procedure produces an IDLH oxygen-deficient atmosphere.

Isolation means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: Blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

Line breaking means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Nonpermit confined space means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen deficient atmosphere means an atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen enriched atmosphere means an atmosphere containing more than 23.5 percent oxygen by volume.

Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics:

- (1) Contains or has a potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- (4) Contains any other recognized serious safety or health hazard.

Permit-required confined space program (permit space program) means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

Permit system means the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

Prohibited condition means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Rescue service means the personnel designated to rescue employees from permit spaces.

Retrieval system means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for nonentry rescue of persons from permit spaces.

Testing means the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

Note: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-62-14501, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14501, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-62-14501, filed 11/22/91, effective 12/24/91. RCW 49.17.040, 49.17.050, and 49.17.240. 80-11-010 (Order 80-14), § 296-62-14501, filed 8/8/80; Order 73-3, § 296-62-14501, filed 5/7/73.]

WAC 296-62-14503 General requirements. (1) The employer shall evaluate the workplace to determine if any spaces are permit-required confined spaces.

Note: Proper application of the decision flow chart in WAC 296-62-14521, Appendix A, would facilitate compliance with this requirement.

(2) If the workplace contains permit spaces, the employer shall inform exposed employees, by posting danger signs or by any other equally effective means, of the existence and location of and the danger posed by the permit spaces.

Note: A sign reading "DANGER-PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or using other similar language would satisfy the requirement for a sign.

(3) If the employer decides that its employees will not enter permit spaces, the employer shall take effective measures to prevent its employees from entering the permit spaces and shall comply with subsections (1), (2), (6), and (8) of this section.

(4) If the employer decides that its employees will enter permit spaces, the employer shall develop and implement a written permit space program that complies with this part. The written program shall be available for inspection by employees and their authorized representatives.

(5) An employer may use the alternate procedures specified in (b) of this subsection for entering a permit space under the conditions set forth in (a) of this subsection.

(a) An employer whose employees enter a permit space need not comply with WAC 296-62-14505 through 296-62-14509 and WAC 296-62-14513 through 296-62-14519, provided that:

(i) The employer can demonstrate that the only hazard posed by the permit space is an actual or potential hazardous atmosphere;

(ii) The employer can demonstrate that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry;

(iii) The employer develops monitoring and inspection data that supports the demonstrations required by (a)(i) and (ii) of this subsection;

(iv) If an initial entry of the permit space is necessary to obtain the data required by (a)(iii) of this subsection, the entry is performed in compliance with WAC 296-62-14505 through 296-62-14519;

(v) The determinations and supporting data required by (a)(i), (ii), and (iii) of this subsection are documented by the employer and are made available to each employee who enters the permit space under the terms of WAC this subsection; and

(vi) Entry into the permit space under the terms of (a) of this subsection is performed in accordance with the requirements of (b) of this subsection.

Note: See subsection (7) of this section for reclassification of a permit space after all hazards within the space have been eliminated.

(b) The following requirements apply to entry into permit spaces that meet the conditions set forth in (a) of this subsection.

(i) Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.

(ii) When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.

(iii) Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for the following conditions in the order given:

- (A) Oxygen content,
- (B) Flammable gases and vapors, and
- (C) Potential toxic air contaminants.

(iv) There may be no hazardous atmosphere within the space whenever any employee is inside the space.

(v) Continuous forced air ventilation shall be used, as follows:

(A) An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;

(B) The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space;

(C) The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.

(vi) The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.

(vii) If a hazardous atmosphere is detected during entry:

(A) Each employee shall leave the space immediately;

(B) The space shall be evaluated to determine how the hazardous atmosphere developed; and

(C) Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

(viii) The employer shall verify that the space is safe for entry and that the preentry measures required by (b) of this subsection have been taken, through a written certification that contains the date, the location of the space, and the signature of the person providing the certification. The certification shall be made before entry and shall be made available to each employee entering the space.

(6) When there are changes in the use or configuration of a nonpermit confined space that might increase the hazards to entrants, the employer shall reevaluate that space and, if necessary, reclassify it as a permit-required confined space.

(7) A space classified by the employer as a permit-required confined space may be reclassified as a nonpermit confined space under the following procedures:

(a) If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a nonpermit confined space for as long as the nonatmospheric hazards remain eliminated.

(b) If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed under WAC 296-62-14505 through 296-62-14519. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a nonpermit confined space for as long as the hazards remain eliminated.

Note: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards. Subsection (5) of this section covers permit space entry where the employer can

demonstrate that forced air ventilation alone will control all hazards in the space.

(c) The employer shall document the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification shall be made available to each employee entering the space.

(d) If hazards arise within a permit space that has been declassified to a nonpermit space under this subsection, each employee in the space shall exit the space. The employer shall then reevaluate the space and determine whether it must be reclassified as a permit space, in accordance with other applicable provisions of this part.

(8) When an employer (host employer) arranges to have employees of another employer (contractor) perform work that involves permit space entry, the host employer shall:

(a) Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this part;

(b) Apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space;

(c) Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;

(d) Coordinate entry operations with the contractor, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by WAC 296-62-14505(11); and

(e) Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

(9) In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

(a) Obtain any available information regarding permit space hazards and entry operations from the host employer;

(b) Coordinate entry operations with the host employer, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by WAC 296-62-14505(11); and

(c) Inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14503, filed 1/18/95, effective 3/1/95; 91-11-070 (Order 91-01), § 296-62-14503, filed 5/20/91, effective 6/20/91; Order 73-3, § 296-62-14503, filed 5/7/73.]

WAC 296-62-14505 Permit-required confined space program (permit space program). Under the permit space program required by WAC 296-62-14503(4), the employer shall:

(1) Implement the measures necessary to prevent unauthorized entry;

(2) Identify and evaluate the hazards of permit spaces before employees enter them;

(3) Develop and implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:

(a) Specifying acceptable entry conditions;

(b) Isolating the permit space;

(c) Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards;

(d) Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards; and

(e) Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.

(4) Provide the following equipment (specified in (a) through (i) of this subsection) at no cost to employees, maintain that equipment properly, and ensure that employees use that equipment properly:

(a) Testing and monitoring equipment needed to comply with subsection (5) of this section;

(b) Ventilating equipment needed to obtain acceptable entry conditions;

(c) Communications equipment necessary for compliance with WAC 296-62-14513(3) and 296-62-14515(5);

(d) Personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees;

(e) Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency;

(f) Barriers and shields as required by subsection (3)(d) of this section;

(g) Equipment, such as ladders, needed for safe ingress and egress by authorized entrants;

(h) Rescue and emergency equipment needed to comply with subsection (9) of this section, except to the extent that the equipment is provided by rescue services; and

(i) Any other equipment necessary for safe entry into and rescue from permit spaces.

(5) Evaluate permit space conditions as follows when entry operations are conducted:

(a) Test conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin, except that, if isolation of the space is infeasible because the space is large or is part of a continuous system (such as a sewer), preentry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entrants are working;

(b) Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations; and

(c) When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gases and vapors.

Note: Atmospheric testing conducted in accordance with WAC 296-62-14523, Appendix B, would be considered as satisfying the requirements of this paragraph. For permit space operations in sewers, atmospheric testing conducted in accordance with Appendix B, as supplemented by WAC 296-62-14529, Appen-

dix E, would be considered as satisfying the requirements of this subdivision.

(6) Provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations;

Note: Attendants may be assigned to monitor more than one permit space provided the duties described in WAC 296-62-14515 can be effectively performed for each permit space that is monitored. Likewise, attendants may be stationed at any location outside the permit space to be monitored as long as the duties described in WAC 296-62-14515 can be effectively performed for each permit space that is monitored. However, it is important to assess if it is appropriate or possible to have multiple permit spaces monitored by a single attendant or have attendants stationed at a location outside the monitored permit space. Due to the variability of permit space work environments, the appropriateness of how a permit space is monitored must be tailored to the requirements of the permit space and the work being performed.

(7) If multiple spaces are to be monitored by a single attendant, include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of the permit spaces being monitored without distraction from the attendant's responsibilities under WAC 296-62-14515;

(8) Designate the persons who are to have active roles (as, for example, authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of each such employee, and provide each such employee with the training required by WAC 296-62-14511;

(9) Develop and implement procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a rescue;

(10) Develop and implement a system for the preparation, issuance, use, and cancellation of entry permits as required by this part;

(11) Develop and implement procedures to coordinate entry operations when employees of more than one employer are working simultaneously as authorized entrants in a permit space, so that employees of one employer do not endanger the employees of any other employer;

(12) Develop and implement procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed;

(13) Review entry operations when the employer has reason to believe that the measures taken under the permit space program may not protect employees and revise the program to correct deficiencies found to exist before subsequent entries are authorized; and

Note: Examples of circumstances requiring the review of the permit space program are: Any unauthorized entry of a permit space, the detection of a permit space hazard not covered by the permit, the detection of a condition prohibited by the permit, the occurrence of an injury or near-miss during entry, a change in the use or configuration of a permit space, and employee complaints about the effectiveness of the program.

(14) Review the permit space program, using the canceled permits retained under WAC 296-62-14507(6) within one year after each entry and revise the program as

necessary, to ensure that employees participating in entry operations are protected from permit space hazards.

Note: Employers may perform a single annual review covering all entries performed during a twelve-month period. If no entry is performed during a twelve-month period, no review is necessary.

WAC 296-62-14525, Appendix C, presents examples of permit space programs that are considered to comply with the requirements of WAC 296-62-14505.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14505, filed 1/18/95, effective 3/1/95; Order 73-3, § 296-62-14505, filed 5/7/73.]

WAC 296-62-14507 Permit system. (1) Before entry is authorized, the employer shall document the completion of measures required by WAC 296-62-14505(3) by preparing an entry permit.

Note: WAC 296-62-14527, Appendix D, presents examples of permits whose elements are considered to comply with the requirements of this part.

(2) Before entry begins, the entry supervisor identified on the permit shall sign the entry permit to authorize entry.

(3) The completed permit shall be made available at the time of entry to all authorized entrants, by posting it at the entry portal or by any other equally effective means, so that the entrants can confirm that preentry preparations have been completed.

(4) The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit in accordance with WAC 296-62-14509(2).

(5) The entry supervisor shall terminate entry and cancel the entry permit when:

(a) The entry operations covered by the entry permit have been completed; or

(b) A condition that is not allowed under the entry permit arises in or near the permit space.

(6) The employer shall retain each canceled entry permit for at least one year to facilitate the review of the permit-required confined space program required by WAC 296-62-14505(14). Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14507, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 81-16-015 (Order 81-20), § 296-62-14507, filed 7/27/81; 80-11-010 (Order 80-14), § 296-62-14507, filed 8/8/80; Order 73-3, § 296-62-14507, filed 5/7/73.]

WAC 296-62-14509 Entry permit. The entry permit that documents compliance with this part and authorizes entry to a permit space shall identify:

(1) The permit space to be entered;

(2) The purpose of the entry;

(3) The date and the authorized duration of the entry permit;

(4) The authorized entrants within the permit space, by name or by such other means (for example, through the use of rosters or tracking systems) as will enable the attendant to determine quickly and accurately, for the duration of the permit, which authorized entrants are inside the permit space;

Note: This requirement may be met by inserting a reference on the entry permit as to the means used, such as a roster or tracking system, to keep track of the authorized entrants within the permit space.

(5) The personnel, by name, currently serving as attendants;

(6) The individual, by name, currently serving as entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry;

(7) The hazards of the permit space to be entered;

(8) The measures used to isolate the permit space and to eliminate or control permit space hazards before entry;

Note: Those measures can include the lockout or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit spaces.

(9) The acceptable entry conditions;

(10) The results of initial and periodic tests performed under WAC 296-62-14505(5), accompanied by the names or initials of the testers and by an indication of when the tests were performed;

(11) The rescue and emergency services that can be summoned and the means (such as the equipment to use and the numbers to call) for summoning those services;

(12) The communication procedures used by authorized entrants and attendants to maintain contact during the entry;

(13) Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided for compliance with this part;

(14) Any other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety; and

(15) Any additional permits, such as for hot work, that have been issued to authorize work in the permit space.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14509, filed 1/18/95, effective 3/1/95; Order 73-3, § 296-62-14509, filed 5/7/73.]

WAC 296-62-14511 Training. (1) The employer shall provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this part.

(2) Training shall be provided to each affected employee:

(a) Before the employee is first assigned duties under this section;

(b) Before there is a change in assigned duties;

(c) Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained;

(d) Whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required by WAC 296-62-14505(3) or that there are inadequacies in the employee's knowledge or use of these procedures.

(3) The training shall establish employee proficiency in the duties required by this part and shall introduce new or revised procedures, as necessary, for compliance with this part.

(4) The employer shall certify that the training required by subsections (1) through (3) of this section has been

accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14511, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-62-14511, filed 11/22/91, effective 12/24/91; Order 73-3, § 296-62-14511, filed 5/7/73.]

WAC 296-62-14513 Duties of authorized entrants.

The employer shall ensure that all authorized entrants:

(1) Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

(2) Properly use equipment as required by WAC 296-62-14505(4);

(3) Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by WAC 296-62-14515(6).

(4) Alert the attendant whenever:

(a) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or

(b) The entrant detects a prohibited condition; and

(5) Exit from the permit space as quickly as possible whenever:

(a) An order to evacuate is given by the attendant or the entry supervisor,

(b) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation,

(c) The entrant detects a prohibited condition, or

(d) An evacuation alarm is activated.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14513, filed 1/18/95, effective 3/1/95; Order 73-3, § 296-62-14513, filed 5/7/73.]

WAC 296-62-14515 Duties of attendants. The employer shall ensure that each attendant:

(1) Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

(2) Is aware of possible behavioral effects of hazard exposure in authorized entrants;

(3) Continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants under WAC 296-62-14509(4) accurately identifies who is in the permit space;

(4) Remains outside the permit space during entry operations until relieved by another attendant;

Note: When the employer's permit entry program allows attendant entry for rescue, attendants may enter a permit space to attempt a rescue if they have been trained and equipped for rescue operations as required by WAC 296-62-14519(1) and if they have been relieved as required by subsection (4) of this section.

(5) Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space under subsection (6) of this section;

(6) Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:

(a) If the attendant detects a prohibited condition;

(b) If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;

(c) If the attendant detects a situation outside the space that could endanger the authorized entrants; or

(d) If the attendant cannot effectively and safely perform all the duties required under this section;

(7) Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards;

(8) Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:

(a) Warn the unauthorized persons that they must stay away from the permit space;

(b) Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and

(c) Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space;

(9) Performs nonentry rescues as specified by the employer's rescue procedure; and

(10) Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14515, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-62-14515, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-15-017 (Order 83-19), § 296-62-14515, filed 7/13/83, effective 9/12/83; 82-13-045 (Order 82-22), § 296-62-14515, filed 6/11/82; Order 73-3, § 296-62-14515, filed 5/7/73.]

WAC 296-62-14517 Duties of entry supervisors.

The employer shall ensure that each entry supervisor:

(1) Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

(2) Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;

(3) Terminates the entry and cancels the permit as required by WAC 296-62-14507(5);

(4) Verifies that rescue services are available and that the means for summoning them are operable;

(5) Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and

(6) Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14517, filed 1/18/95, effective 3/1/95; Order 73-3, § 296-62-14517, filed 5/7/73.]

WAC 296-62-14519 Rescue and emergency services.

(1) The following requirements apply to employers who have employees enter permit spaces to perform rescue services.

(a) The employer shall ensure that each member of the rescue service is provided with, and is trained to use

properly, the personal protective equipment and rescue equipment necessary for making rescues from permit spaces.

(b) Each member of the rescue service shall be trained to perform the assigned rescue duties. Each member of the rescue service shall also receive the training required of authorized entrants under WAC 296-62-14511.

(c) Each member of the rescue service shall practice making permit space rescues at least once every twelve months, by means of simulated rescue operations in which they remove dummies, mannequins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.

(d) Each member of the rescue service shall be trained in basic first-aid and in cardiopulmonary resuscitation (CPR). At least one member of the rescue service holding current certification in first aid and in CPR shall be available.

(2) When an employer (host employer) arranges to have persons other than the host employer's employees perform permit space rescue, the host employer shall:

(a) Inform the rescue service of the hazards they may confront when called on to perform rescue at the host employer's facility, and

(b) Provide the rescue service with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.

(3) To facilitate nonentry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements.

(a) Each authorized entrant shall use a chest or full-body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, or above the entrant's head. Wristlets may be used in lieu of the chest or full-body harness if the employer can demonstrate that the use of a chest or full-body harness is infeasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative.

(b) The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than five feet (1.52 m) deep.

(4) If an injured entrant is exposed to a substance for which a material safety data sheet (MSDS) or other similar written information is required to be kept at the worksite, that MSDS or written information shall be made available to the medical facility treating the exposed entrant.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14519, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-62-14519, filed 11/22/91, effective 12/24/91; Order 73-3, § 296-62-14519, filed 5/7/73.]

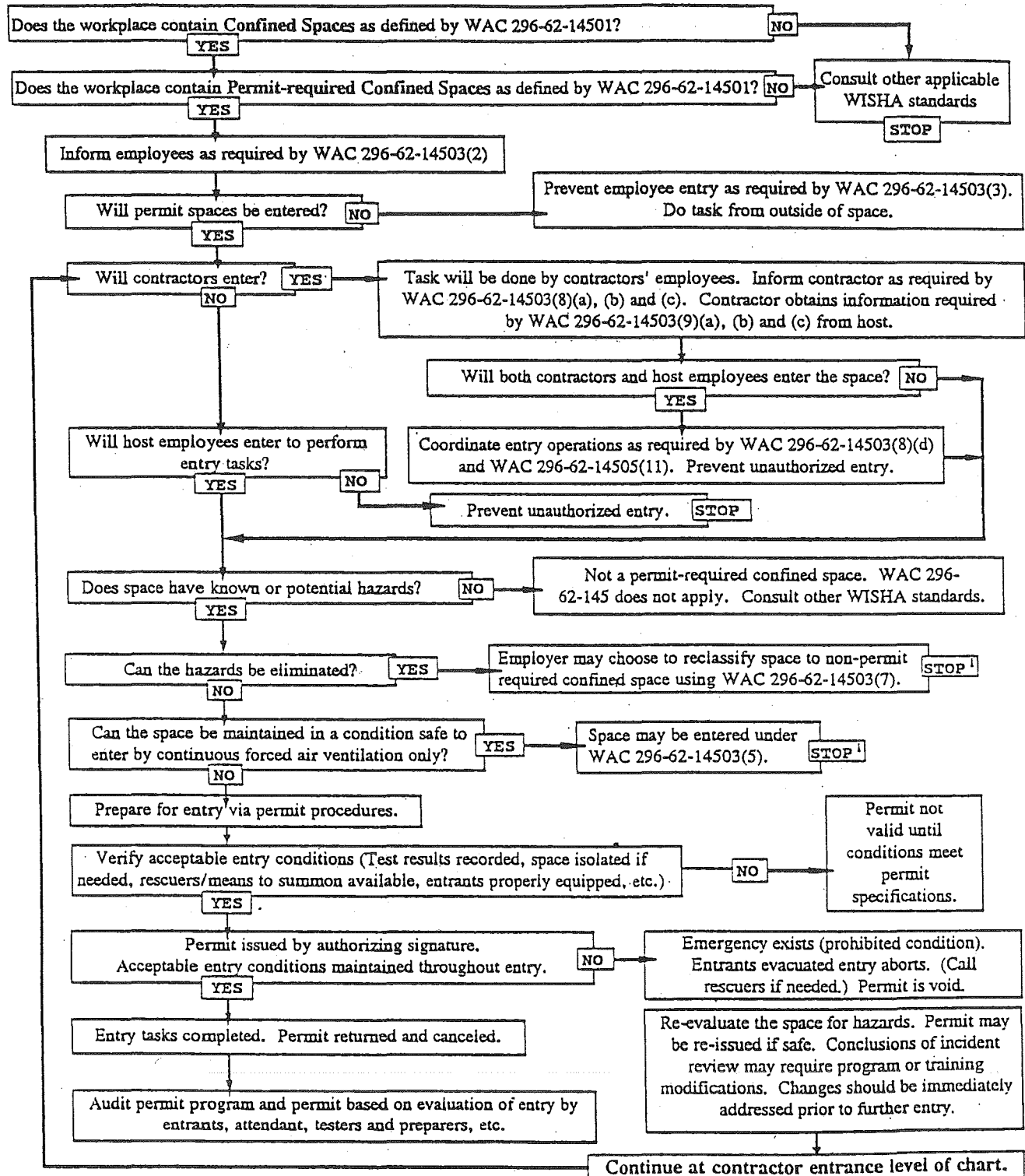
WAC 296-62-14520 Appendices to WAC 296-62-145—Permit-required confined spaces.

Note: Appendices A through E serve to provide information and nonmandatory guidelines to assist employers and employees in complying with the appropriate requirements of this part.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14520, filed 1/18/95, effective 3/1/95.]

WAC 296-62-14521 Appendix A—Permit-required confined space decision flow chart.

WAC 296-62-14521 Appendix A Permit-required Confined Space Decision Flow Chart



¹ Spaces may have to be evacuated and re-evaluated if hazards arise during entry

WAC 296-62-14523 Appendix B—Procedures for atmospheric testing. Atmospheric testing is required for two distinct purposes: Evaluation of the hazards of the permit space and verification that acceptable entry conditions for entry into that space exist.

(1) Evaluation testing. The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specificity to identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space. Evaluation and interpretation of these data, and development of the entry procedure, should be done by, or reviewed by, a technically qualified professional (e.g., WISHA consultation service, or certified industrial hygienist, registered safety engineer, certified safety professional, certified marine chemist, etc.) based on evaluation of all serious hazards.

(2) Verification testing. The atmosphere of a permit space which may contain a hazardous atmosphere should be tested for residues of all contaminants identified by evaluation testing using permit specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions. Results of testing (i.e., actual concentration, etc.) should be recorded on the permit in the space provided adjacent to the stipulated acceptable entry condition.

(3) Duration of testing. Measurement of values for each atmospheric parameter should be made for at least the minimum response time of the test instrument specified by the manufacturer.

(4) Testing stratified atmospheres. When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately four feet (1.22 m) in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress should be slowed to accommodate the sampling speed and detector response.

(5) Order of testing. A test for oxygen is performed first because most combustible gas meters are oxygen dependent and will not provide reliable readings in an oxygen deficient atmosphere. Combustible gases are tested for next because the threat of fire or explosion is both more immediate and more life threatening, in most cases, than exposure to toxic gases and vapors. If tests for toxic gases and vapors are necessary, they are performed last.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14523, filed 1/18/95, effective 3/1/95; Order 73-3, § 296-62-14523, filed 5/7/73.]

WAC 296-62-14525 Appendix C—Examples of permit-required confined space programs. Example 1. Workplace. Sewer entry.

(1) Potential hazards. The employees could be exposed to the following:

(a) Engulfment.

(b) Presence of toxic gases. Equal to or more than 10 ppm hydrogen sulfide measured as an eight-hour time-weighted average. If the presence of other toxic contaminants is suspected, specific monitoring programs will be developed.

(c) Presence of explosive/flammable gases. Equal to or greater than ten percent of the lower flammable limit (LFL).

(d) Oxygen deficiency. A concentration of oxygen in the atmosphere equal to or less than 19.5% by volume.

(2) Entry without permit/attendant:

(a) Certification. Confined spaces may be entered without the need for a written permit or attendant provided that the space can be maintained in a safe condition for entry by mechanical ventilation alone, as provided in WAC 296-62-14503(5). All spaces shall be considered permit-required confined spaces until the preentry procedures demonstrate otherwise. Any employee required or permitted to precheck or enter an enclosed/confined space shall have successfully completed, as a minimum, the training as required by the following sections of these procedures.

A written copy of operating and rescue procedures as required by these procedures shall be at the work site for the duration of the job. The confined space preentry check list must be completed by the LEAD WORKER before entry into a confined space. This list verifies completion of items listed below. This check list shall be kept at the job site for duration of the job. If circumstances dictate an interruption in the work, the permit space must be reevaluated and a new check list must be completed.

(b) Control of atmospheric and engulfment hazards.

(i) Pumps and lines. All pumps and lines which may reasonably cause contaminants to flow into the space shall be disconnected, blinded and locked out, or effectively isolated by other means to prevent development of dangerous air contamination or engulfment. Not all laterals to sewers or storm drains require blocking. However, where experience or knowledge of industrial use indicates there is a reasonable potential for contamination of air or engulfment into an occupied sewer, then all affected laterals shall be blocked. If blocking and/or isolation requires entry into the space the provisions for entry into a permit-required confined space must be implemented.

(ii) Surveillance. The surrounding area shall be surveyed to avoid hazards such as drifting vapors from the tanks, piping, or sewers.

(iii) Testing. The atmosphere within the space will be tested to determine whether dangerous air contamination and/or oxygen deficiency exists. Detector tubes, alarm only gas monitors and explosion meters are examples of monitoring equipment that may be used to test permit space atmospheres. Testing shall be performed by the LEAD WORKER who has successfully completed the gas detector training for the monitor to be used. The minimum parameters to be monitored are oxygen deficiency, LFL, and hydrogen sulfide concentration. A written record of the preentry test results shall be made and kept at the work site for the duration of the job. The supervisor will certify in writing, based upon the results of the preentry testing, that all hazards have been eliminated. Affected employees shall be able to review the testing results. The most hazardous conditions shall govern when work is being performed in two adjoining, connecting spaces.

(c) Entry procedures. If there are no nonatmospheric hazards present and if the preentry tests show there is no dangerous air contamination and/or oxygen deficiency within the space and there is no reason to believe that any is likely to develop, entry into and work within may proceed.

Continuous testing of the atmosphere in the immediate vicinity of the workers within the space shall be accomplished. The workers will immediately leave the permit space when any of the gas monitor alarm set points are reached as defined. Workers will not return to the area until a SUPERVISOR who has completed the gas detector training has used a direct reading gas detector to evaluate the situation and has determined that it is safe to enter.

(d) Rescue. Arrangements for rescue services are not required where there is no attendant. See the rescue portion of subsection (3), below, for instructions regarding rescue planning where an entry permit is required.

(3) Entry permit required.

(a) Permits. Confined space entry permit. All spaces shall be considered permit-required confined spaces until the preentry procedures demonstrate otherwise. Any employee required or permitted to precheck or enter a permit-required confined space shall have successfully completed, as a minimum, the training as required by the following sections of these procedures.

A written copy of operating and rescue procedures as required by these procedures shall be at the work site for the duration of the job. The confined space entry permit must be completed before approval can be given to enter a permit-required confined space. This permit verifies completion of items listed below. This permit shall be kept at the job site for the duration of the job. If circumstances cause an interruption in the work or a change in the alarm conditions for which entry was approved, a new confined space entry permit must be completed.

(b) Control of atmospheric and engulfment hazards.

(i) Surveillance. The surrounding area shall be surveyed to avoid hazards such as drifting vapors from tanks, piping or sewers.

(ii) Testing. The confined space atmosphere shall be tested to determine whether dangerous air contamination and/or oxygen deficiency exists. A direct reading gas monitor shall be used. Testing shall be performed by the SUPERVISOR who has successfully completed the gas detector training for the monitor he/she will use.

The minimum parameters to be monitored are oxygen deficiency, LFL and hydrogen sulfide concentration. A written record of the preentry test results shall be made and kept at the work site for the duration of the job. Affected employees shall be able to review the testing results. The most hazardous conditions shall govern when work is being performed in two adjoining, connected spaces.

(iii) Space ventilation. Mechanical ventilation systems, where applicable, shall be set at one hundred percent outside air. Where possible, open additional manholes to increase air circulation. Use portable blowers to augment natural circulation if needed. After a suitable ventilating period, repeat the testing. Entry may not begin until testing has demonstrated that the hazardous atmosphere has been eliminated.

(c) Entry procedures. The following procedure shall be observed under any of the following conditions:

(i) Testing demonstrates the existence of dangerous or deficient conditions and additional ventilation cannot reduce concentrations to safe levels;

(ii) The atmosphere tests as safe but unsafe conditions can reasonably be expected to develop;

(iii) It is not feasible to provide for ready exit from spaces equipped with automatic fire suppression systems and it is not practical or safe to deactivate such systems; or

(iv) An emergency exists and it is not feasible to wait for preentry procedures to take effect.

(d) All personnel must be trained. A self-contained breathing apparatus shall be worn by any person entering the space. At least one worker shall stand by the outside of the space ready to give assistance in case of emergency. The standby worker shall have a self-contained breathing apparatus available for immediate use. There shall be at least one additional worker within sight or call of the standby worker. Continuous powered communications shall be maintained between the worker within the confined space and standby personnel.

(e) If at any time there is any questionable action or nonmovement by the worker inside, a verbal check will be made. If there is no response, the worker will be moved immediately.

Exception: If the worker is disabled due to falling or impact, he/she shall not be removed from the confined space unless there is immediate danger to his/her life. Local fire department rescue personnel shall be notified immediately. The standby worker may only enter the confined space in case of an emergency (wearing the self-contained breathing apparatus) and only after being relieved by another worker. Safety belt or harness with attached lifeline shall be used by all workers entering the space with the free end of the line secured outside the entry opening. The standby worker shall attempt to remove a disabled worker via his/her lifeline before entering the space.

(f) When practical, these spaces shall be entered through side openings - those within three and one-half feet (1.07 m) of the bottom. When entry must be through a top opening, the safety belt shall be of the harness type that suspends a person upright and a hoisting device or similar apparatus shall be available for lifting workers out of the space.

(g) In any situation where their use may endanger the worker, use of a hoisting device or safety belt and attached lifeline may be discontinued.

(h) When dangerous air contamination is attributable to flammable and/or explosive substances, lighting and electrical equipment shall be Class 1, Division 1 rated per National Electrical Code and no ignition sources shall be introduced into the area.

(i) Continuous gas monitoring shall be performed during all confined space operations. If alarm conditions change adversely, entry personnel shall exit the confined space and a new confined space permit issued.

(j) Rescue. Call the fire department services for rescue. Where immediate hazards to injured personnel are present, workers at the site shall implement emergency procedures to fit the situation.

Example 2. Workplace. Meat and poultry rendering plants.

Cookers and dryers are either batch or continuous in their operation. Multiple batch cookers are operated in parallel. When one unit of a multiple set is shut down for repairs, means are available to isolate that unit from the others which remain in operation.

Cookers and dryers are horizontal, cylindrical vessels equipped with a center, rotating shaft and agitator paddles or discs. If the inner shell is jacketed, it is usually heated with steam at pressures up to 150 psig (1034.25 kPa). The

rotating shaft assembly of the continuous cooker or dryer is also steam heated.

(1) Potential hazards. The recognized hazards associated with cookers and dryers are the risk that employees could be:

- (a) Struck or caught by rotating agitator;
- (b) Engulfed in raw material or hot, recycled fat;
- (c) Burned by steam from leaks into the cooker/dryer steam jacket or the condenser duct system if steam valves are not properly closed and locked out;
- (d) Burned by contact with hot metal surfaces, such as the agitator shaft assembly, or inner shell of the cooker/dryer;
- (e) Heat stress caused by warm atmosphere inside cooker/dryer;
- (f) Slipping and falling on grease in the cooker/dryer;
- (g) Electrically shocked by faulty equipment taken into the cooker/dryer;
- (h) Burned or overcome by fire or products of combustion; or
- (i) Overcome by fumes generated by welding or cutting done on grease covered surfaces.

(2) Permits. The supervisor in this case is always present at the cooker/dryer or other permit entry confined space when entry is made. The supervisor must follow the preentry isolation procedures described in the entry permit in preparing for entry, and ensure that the protective clothing, ventilating equipment and any other equipment required by the permit are at the entry site.

(3) Control of hazards. Mechanical. Lock out main power switch to agitator motor at main power panel. Affix tag to the lock to inform others that a permit entry confined space entry is in progress.

(4) Engulfment. Close all valves in the raw material blow line. Secure each valve in its closed position using chain and lock. Attach a tag to the valve and chain warning that a permit entry confined space entry is in progress. The same procedure shall be used for securing the fat recycle valve.

(5) Burns and heat stress. Close steam supply valves to jacket and secure with chains and tags. Insert solid blank at flange in cooker vent line to condenser manifold duct system. Vent cooker/dryer by opening access door at discharge end and top center door to allow natural ventilation throughout the entry. If faster cooling is needed, use a portable ventilation fan to increase ventilation. Cooling water may be circulated through the jacket to reduce both outer and inner surface temperatures of cooker/dryers faster. Check air and inner surface temperatures in cooker/dryer to assure they are within acceptable limits before entering, or use proper protective clothing.

(6) Fire and fume hazards. Careful site preparation, such as cleaning the area within four inches (10.16 cm) of all welding or torch cutting operations, and proper ventilation are the preferred controls. All welding and cutting operations shall be done in accordance with the requirements of chapter 296-24 WAC, Part I, Welding, cutting, and brazing. Proper ventilation may be achieved by local exhaust ventilation, or the use of portable ventilation fans, or a combination of the two practices.

(7) Electrical shock. Electrical equipment used in cooker/dryers shall be in serviceable condition.

(8) Slips and falls. Remove residual grease before entering cooker/dryer.

(9) Attendant. The supervisor shall be the attendant for employees entering cooker/dryers.

(10) Permit. The permit shall specify how isolation shall be done and any other preparations needed before making entry. This is especially important in parallel arrangements of cooker/dryers so that the entire operation need not be shut down to allow safe entry into one unit.

(11) Rescue. When necessary, the attendant shall call the employer's trained rescue team or the local fire services as previously arranged.

Example 3. Workplace. Workplaces where tank cars, trucks, and trailers, dry-bulk tanks and trailers, railroad tank cars, and similar portable tanks are fabricated or serviced.

(1) During fabrication. These tanks and dry-bulk carriers are entered repeatedly throughout the fabrication process. These products are not configured identically, but the manufacturing processes by which they are made are very similar.

(a) Sources of hazards. In addition to the mechanical hazards arising from the risks that an entrant would be injured due to contact with components of the tank or the tools being used, there is also the risk that a worker could be injured by breathing fumes from welding materials or mists or vapors from materials used to coat the tank interior. In addition, many of these vapors and mists are flammable, so the failure to properly ventilate a tank could lead to a fire or explosion.

(b) Control of hazards.

(i) Welding. Local exhaust ventilation shall be used to remove welding fumes once the tank or carrier is completed to the point that workers may enter and exit only through a manhole. (Follow the requirements of chapter 296-24 WAC, Part I, Welding, cutting and brazing, at all times.) Welding gas tanks may never be brought into a tank or carrier that is a permit entry confined space.

(ii) Application of interior coatings/linings. Atmospheric hazards shall be controlled by forced air ventilation sufficient to keep the atmospheric concentration of flammable materials below ten percent of the lower flammable limit (LFL) (or lower explosive limit (LEL), whichever term is used locally). The appropriate respirators are provided and shall be used in addition to providing forced ventilation if the forced ventilation does not maintain acceptable respiratory conditions.

(c) Permits. Because of the repetitive nature of the entries in these operations, an "area entry permit" will be issued for a one-month period to cover those production areas where tanks are fabricated to the point that entry and exit are made using manholes.

(d) Authorization. Only the area supervisor may authorize an employee to enter a tank within the permit area. The area supervisor must determine that conditions in the tank trailer, dry-bulk trailer or truck, etc., meet permit requirements before authorizing entry.

(e) Attendant. The area supervisor shall designate an employee to maintain communication by employer specified means with employees working in tanks to ensure their

safety. The attendant may not enter any permit entry confined space to rescue an entrant or for any other reason, unless authorized by the rescue procedure and, and even then, only after calling the rescue team and being relieved by an attendant by another worker.

(f) Communications and observation. Communications between attendant and entrant(s) shall be maintained throughout entry. Methods of communication that may be specified by the permit include voice, voice-powered radio, tapping or rapping codes on tank walls, signaling tugs on a rope, and the attendant's observation that work activities such as chipping, grinding, welding, spraying, etc., which require deliberate operator control continue normally. These activities often generate so much noise that the necessary hearing protection makes communication by voice difficult.

(g) Rescue procedures. Acceptable rescue procedures include entry by a team of employee-rescuers, use of public emergency services, and procedures for breaching the tank. The area permit specifies which procedures are available, but the area supervisor makes the final decision based on circumstances. (Certain injuries may make it necessary to breach the tank to remove a person rather than risk additional injury by removal through an existing manhole. However, the supervisor must ensure that no breaching procedure used for rescue would violate terms of the entry permit. For instance, if the tank must be breached by cutting with a torch, the tank surfaces to be cut must be free of volatile or combustible coatings within four inches (10.16 cm) of the cutting line and the atmosphere within the tank must be below the LFL.)

(h) Retrieval line and harnesses. The retrieval lines and harnesses generally required under this standard are usually impractical for use in tanks because the internal configuration of the tanks and their interior baffles and other structures would prevent rescuers from hauling out injured entrants. However, unless the rescue procedure calls for breaching the tank for rescue, the rescue team shall be trained in the use of retrieval lines and harnesses for removing injured employees through manholes.

(2) Repair or service of "used" tanks and bulk trailers.

(a) Sources of hazards. In addition to facing the potential hazards encountered in fabrication or manufacturing, tanks or trailers which have been in service may contain residues of dangerous materials, whether left over from the transportation of hazardous cargoes or generated by chemical or bacterial action on residues of nonhazardous cargoes.

(b) Control of atmospheric hazards. A "used" tank shall be brought into areas where tank entry is authorized only after the tank has been emptied, cleansed (without employee entry) of any residues, and purged of any potential atmospheric hazards.

(c) Welding. In addition to tank cleaning for control of atmospheric hazards, coating and surface materials shall be removed four inches (10.16 cm) or more from any surface area where welding or other torch work will be done and care taken that the atmosphere within the tank remains well below the LFL. (Follow the requirements of chapter 296-24 WAC, Part I, Welding, cutting and brazing, at all times.)

(d) Permits. An entry permit valid for up to one year shall be issued prior to authorization of entry into used tank trailers, dry-bulk trailers or trucks. In addition to the preentry cleaning requirement, this permit shall require the

employee safeguards specified for new tank fabrication or construction permit areas.

(e) Authorization. Only the area supervisor may authorize an employee to enter a tank trailer, dry-bulk trailer or truck within the permit area. The area supervisor must determine that the entry permit requirements have been met before authorizing entry.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14525, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-62-14525, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-03-023 (Order 82-1), § 296-62-14525, filed 1/15/82; Order 73-3, § 296-62-14525, filed 5/7/73.]

WAC 296-62-14527, Appendix D, Sample A

Confined Space Entry Permit

Date & Time Issued: _____

Job site/Space I.D.: _____

Equipment to be worked on: _____

Date & Time Expires: _____

Job Supervisor: _____

Work to be performed: _____

Stand-by personnel _____

1. Atmospheric Checks: Time _____
 Oxygen _____ %
 Explosive _____ % L.F.L.
 Toxic _____ PPM

2. Tester's signature _____

3. Source isolation (No Entry): N/A YES NO
 Pumps or lines blinded, () () ()
 disconnected, or blocked () () ()

4. Ventilation Modification: N/A YES NO
 Mechanical () () ()
 Natural Ventilation only () () ()

5. Atmospheric check after isolation and Ventilation:

Oxygen _____ % > 19.5%
 Explosive _____ % L.F.L. < 10 %
 Toxic _____ PPM < 10 PPM H₂S
 Time _____
 Testers signature _____

6. Communication procedures: _____

7. Rescue procedures: _____

8. Entry, standby, and back up persons: Yes No
 Successfully completed required () ()
 training? () ()
 Is it current? () ()

9. Equipment: N/A Yes No
 Direct reading gas monitor - () () ()
 tested
 Safety harnesses and lifelines () () ()
 for entry and standby persons
 Hoisting equipment () () ()
 Powered communications () () ()
 SCBA's for entry and standby () () ()
 persons
 Protective Clothing () () ()
 All electric equipment listed
 Class I, Division I, Group D () () ()
 and Non-sparking tools

10. Periodic atmospheric tests:
 Oxygen _____ % Time _____ Oxygen _____ % Time _____
 Oxygen _____ % Time _____ Oxygen _____ % Time _____
 Explosive _____ % Time _____ Explosive _____ % Time _____
 Explosive _____ % Time _____ Explosive _____ % Time _____
 Toxic _____ % Time _____ Toxic _____ % Time _____
 Toxic _____ % Time _____ Toxic _____ % Time _____

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit Prepared By: (Supervisor) _____

Approved By: (Unit Supervisor) _____

Reviewed By: (Cs Operations Personnel) _____

(printed name)

(signature)

This permit to be kept at job site. Return job site copy to Safety Office following job completion.

WAC 296-62-14527, Appendix D, Sample B

ENTRY PERMIT

PERMIT VALID FOR 8 HOURS ONLY. ALL PERMIT COPIES REMAIN AT SITE UNTIL JOB COMPLETED.

DATE: - - SITE LOCATION/DESCRIPTION _____

PURPOSE OF ENTRY _____

SUPERVISOR(S) in charge of crews. _____

Type of Crew _____

Phone # _____

COMMUNICATION PROCEDURES _____

RESCUE PROCEDURES (PHONE NUMBERS AT BOTTOM) _____

BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED AND REVIEWED PRIOR TO ENTRY

REQUIREMENTS COMPLETED	DATE	TIME	REQUIREMENTS COMPLETED	DATE	TIME
LockOut/De-energize/Try-out	_____	_____	Full Body Harness w/"D" ring	_____	_____
Line(s) Broken-Capped-Blank	_____	_____	Emergency Escape Retrieval Eq	_____	_____
Purge-Flush and Vent	_____	_____	Lifelines	_____	_____
Ventilation	_____	_____	Fire Extinguishers	_____	_____
Secure Area (Post and Flag)	_____	_____	Lighting (Explosive Proof)	_____	_____
Breathing Apparatus	_____	_____	Protective Clothing	_____	_____
Resuscitator - Inhalator	_____	_____	Respirator(s) (Air Purifying)	_____	_____
Standby Safety Personnel	_____	_____	Burning and Welding Permit	_____	_____

Note: Items that do not apply enter N/A in the blank.

** RECORD CONTINUOUS MONITORING RESULTS EVERY 2 HOURS **

CONTINUOUS MONITORING**

TEST(S) TO BE TAKEN

PERCENT OF OXYGEN

LOWER FLAMMABLE LIMIT

CARBON MONOXIDE

Aromatic Hydrocarbon

Hydrogen Cyanide

Hydrogen Sulfide

Sulfur Dioxide

Ammonia

Permissible

Entry Level

19.5% to 23.5%

Under 10%

+35 PPM

+ 1 PPM * 5 PPM

(Skin) * 4 PPM

+10 PPM * 15 PPM

+ 2 PPM * 5 PPM

* 35 PPM

* Short-term exposure limit: Employee can work in the area up to 15 minutes.

+ 8 hr. Time Weighted Avg.: Employee can work in area 8 hrs (longer with appropriate respiratory protection).

REMARKS: _____

GAS TESTER NAME & CHECK # _____

INSTRUMENT(S) USED _____

MODEL &/OR TYPE _____

SERIAL &/OR UNIT # _____

SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

SAFETY STANDBY PERSON(S) _____

CHECK # _____

CONFINED SPACE ENTRANT(S) _____

CHECK # _____

CONFINED SPACE ENTRANT(S) _____

CHECK # _____

SUPERVISOR AUTHORIZATION - ALL CONDITIONS SATISFIED _____

DEPARTMENT/PHONE # _____

ABULANCE # _____

FIRE # _____

Safety # _____

Gas Coordinator # _____

WAC 296-62-14529 Appendix E—Sewer system entry. Sewer entry differs in three vital respects from other permit entries:

- There rarely exists any way to completely isolate the space (a section of a continuous system) to be entered;
- Because isolation is not complete, the atmosphere may suddenly and unpredictably become lethally hazardous (toxic, flammable or explosive) from causes beyond the control of the entrant or employer; and
- Experienced sewer workers are especially knowledgeable in entry and work in their permit spaces because of their frequent entries. Unlike other employments where permit space entry is a rare and exceptional event, sewer workers' usual work environment is a permit space.

(1) Adherence to procedure. The employer should designate as entrants only employees who are thoroughly trained in the employer's sewer entry procedures and who demonstrate that they follow these entry procedures exactly as prescribed when performing sewer entries.

(2) Atmospheric monitoring. Entrants should be trained in the use of, and be equipped with, atmospheric monitoring equipment which sounds an audible alarm, in addition to its visual readout, whenever one of the following conditions is encountered: Oxygen concentration less than 19.5 percent; flammable gas or vapor at ten percent or more of the lower flammable limit (LFL); or hydrogen sulfide or carbon monoxide at or above 10 ppm or 35 ppm, respectively, measured as an eight-hour time-weighted average.

Atmospheric monitoring equipment needs to be calibrated according to the manufacturer's instructions. The oxygen sensor/broad range sensor is best suited for initial use in situations where the actual or potential contaminants have not been identified, because broad range sensors, unlike substance-specific sensors, enable employers to obtain an overall reading of the hydrocarbons (flammables) present in the space.

However, such sensors only indicate that a hazardous threshold of a class of chemicals has been exceeded. They do not measure the levels of contamination of specific substances. Therefore, substance-specific devices, which measure the actual levels of specific substances, are best suited for use where actual and potential contaminants have been identified.

The measurements obtained with substance-specific devices are of vital importance to the employer when decisions are made concerning the measures necessary to protect entrants (such as ventilation or personal protective equipment) and the setting and attainment of appropriate entry conditions. However, the sewer environment may suddenly and unpredictably change, and the substance-specific devices may not detect the potentially lethal atmospheric hazards which may enter the sewer environment.

(a) Although WISHA considers the information and guidance provided above to be appropriate and useful in most sewer entry situations, the department emphasizes that each employer must consider the unique circumstances, including the predictability of the atmosphere, of the sewer permit spaces in the employer's workplace in preparing for entry. Only the employer can decide, based upon his or her knowledge of, and experience with permit spaces in sewer

systems, what the best type of testing instrument may be for any specific entry operation.

(b) The selected testing instrument should be carried and used by the entrant in sewer line work to monitor the atmosphere in the entrant's environment, and in advance of the entrant's direction of movement, to warn the entrant of any deterioration in atmospheric condition. Where several entrants are working together in the same immediate location, one instrument, used by the lead entrant, is acceptable.

(3) Surge flow and flooding. Sewer crews should develop and maintain liaison, to the extent possible, with the local weather bureau and fire and emergency services in their area so that sewer work may be delayed or interrupted and entrants withdrawn whenever sewer lines might be suddenly flooded by rain or fire suppression activities, or whenever flammable or other hazardous materials are released into sewers during emergencies by industrial or transportation accidents.

(4) Special equipment. Entry into large bore sewers may require the use of special equipment. Such equipment might include such items as atmosphere monitoring devices with automatic audible alarms, escape self-contained breathing apparatus (ESCBA) with at least ten minute air supply (or other NIOSH approved self-rescuer), and waterproof flashlights, and may also include boats and rafts, radios and rope stand-offs for pulling around bends and corners as needed.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-62-14529, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-14529, filed 1/18/95, effective 3/1/95; Order 73-3, § 296-62-14529, filed 5/7/73.]

WAC 296-62-3010 Safety and health program.

Note: Safety and health programs developed and implemented to meet other federal, state, or local regulations are considered acceptable in meeting this requirement if they cover or are modified to cover the topics required in this section. An additional or separate safety and health program is not required by this section.

(1) General.

(a) Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. The program shall be designed to identify, evaluate, and control safety and health hazards and provide for emergency response for hazardous waste operations.

(b) The written safety and health program shall incorporate the following:

- (i) An organizational structure;
- (ii) A comprehensive workplan;
- (iii) A site-specific safety and health plan which need not repeat the employer's standard operating procedures required in (b)(vi) of this subsection;
- (iv) The safety and health training program;
- (v) The medical surveillance program;
- (vi) The employer's standard operating procedures for safety and health; and
- (vii) Any necessary interface between general program and site specific activities.

(c) Site excavation. Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped as appropriate to prevent accidental

collapse in accordance with subpart N of chapter 296-155 WAC.

(d) Contractors and subcontractors. An employer who retains contractor or subcontractor services for work in hazardous waste operations shall inform those contractors, subcontractors, or their representatives of the site emergency response procedures and any potential fire, explosion, health, safety, or other hazards of the hazardous waste operation that have been identified by the employer, including those identified in the employer's information program.

(e) Program availability. The written safety and health program shall be made available to any contractor or subcontractor or their representative who will be involved with the hazardous waste operation; to employees; to employee designated representatives; to WISHA personnel, and to personnel of other federal, state, or local agencies with regulatory authority over the site.

(2) Organizational structure part of the site program.

(a) The organizational structure part of the program shall establish the specific chain of command and specify the overall responsibilities of supervisors and employees. It shall include at a minimum, the following elements:

(i) A general supervisor who has the responsibility and authority to direct all hazardous waste operations.

(ii) A site safety and health supervisor who has the responsibility and authority to develop and implement the site safety and health plan and verify compliance.

(iii) All other personnel needed for hazardous waste site operations and emergency response and their general functions and responsibilities.

(iv) The lines of authority, responsibility, and communication.

(b) The organizational structure shall be reviewed and updated as necessary to reflect the current status of waste site operations.

(3) Comprehensive workplan part of the site program. The comprehensive workplan shall address the tasks and objectives of site operations and the logistics and resources required to reach those tasks and objectives.

(a) The comprehensive workplan shall address anticipated clean-up activities as well as normal operating procedures which need not repeat the employers procedures available elsewhere.

(b) The comprehensive workplan shall define work tasks and objectives and identify the methods for accomplishing those tasks and objectives.

(c) The comprehensive workplan shall establish personnel requirements for implementing the plan.

(d) The comprehensive workplan shall provide for the implementation of the training required in WAC 296-62-3040.

(e) The comprehensive workplan shall provide for the implementation of the required informational programs required in WAC 296-62-3080.

(f) The comprehensive workplan shall provide for the implementation of the medical surveillance program described in WAC 296-62-3050.

(4) Site-specific safety and health plan part of the program.

(a) General. The site safety and health plan, which must be kept on site, shall address the safety and health

hazards of each phase of site operation; and include the requirements and procedures for employee protection.

(b) Elements. The site safety and health plan, as a minimum, shall address the following:

(i) Names of key personnel and alternates responsible for site safety and health, including a site safety and health supervisor.

(ii) A safety and health risk or hazard analysis for each site task and operation found in the workplan.

(iii) Employee training assignments to assure compliance with WAC 296-62-3040.

(iv) Personal protective equipment to be used by employees for each of the site tasks and operations being conducted as required by the personal protective equipment program in WAC 296-62-3060(5).

(v) Medical surveillance requirements in accordance with the program in WAC 296-62-3050.

(vi) Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.

(vii) Site control measures in accordance with the site control program required in WAC 296-62-3030.

(viii) Decontamination procedures in accordance with WAC 296-62-3100.

(ix) An emergency response plan meeting the requirements of WAC 296-62-3110 for safe and effective responses to emergencies, including the necessary PPE and other equipment.

(x) Confined space and permit-required confined space entry procedures as addressed in chapter 296-62 WAC, Part M.

(xi) A spill containment program meeting the requirements of WAC 296-62-3090.

(c) Preentry briefing. The site specific safety and health plan shall provide for preentry briefings to be held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed. The information and data obtained from site characterization and analysis work required in WAC 296-62-3020 shall be used to prepare and update the site safety and health plan.

(d) Effectiveness of site safety and health plan. Inspections shall be conducted by the site safety and health supervisor or, in the absence of that individual, another individual who is knowledgeable in occupational safety and health acting on behalf of the employer as necessary to determine the effectiveness of the site safety and health plan. Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the employer.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-3010, filed 1/18/95, effective 3/1/95; 89-21-018 (Order 89-10), § 296-62-3010, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3010, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3040 Training. (1) General.

(a) All employees working on site (such as but not limited to equipment operators, general laborers, and others) exposed to hazardous substances, health hazards, or safety hazards, and their supervisors and management responsible for the site, shall receive training meeting the requirements

of this subsection before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall review training as specified in this subsection.

(b) Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

(2) Elements to be covered. The training shall thoroughly cover the following:

(a) Names of personnel and alternates responsible for site safety and health;

(b) Safety, health, and other hazards present on the site;

(c) Use of personal protective equipment;

(d) Work practices by which the employee can minimize risks from hazards;

(e) Safe use of engineering controls and equipment on the site;

(f) Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards; and

(g) The contents of items (vii) through (x) of the site safety and health plan set forth in WAC 296-62-3010 (4)(b).

(3) Initial training. General site workers (such as equipment operators, general laborers, and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive the following required training:

(a) General site workers required to wear Level A or Level B personal protective equipment because of the types of hazards to which they are exposed or have the potential for being exposed are required to have 80 hours of training and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(b) General site workers required to wear Level C or D personal protective equipment, equipment operators or transport vehicle operators, are required to have 40 hours of training and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(c) General site workers on site only occasionally for specific limited tasks, and supervisors not working in the two inner zones are required to have 24 hours of training. For example, certain Environmental Protection Agency, and department of ecology employees, labor and industries inspectors and other short-term monitoring and surveying personnel would be required to only have 24 hours of training if they are on-site only occasionally for a specific limited task and are unlikely to be exposed over permissible exposure levels and published exposure limits. A minimum of one day actual field experience under direct supervision is also required.

(d) Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(e) Workers with 24 hours of training who are covered by (c) and (d) of this subsection, and who become general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in (b) of this subsection.

(4) Management and supervisor training. On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive the same initial training as listed in subsection (3) of this section, and three days of supervised field experience and at least eight additional hours of specialized training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.

(5) Law enforcement at illicit drug labs.

Exception: WISHA did not intend application of the 80 hour training requirement to law enforcement personnel required to enter illicit drug labs, secure the premise, and obtain necessary evidence for law enforcement purposes. Attendance at a specific 40 hours course, such as that presented by the criminal justice training commission, is acceptable.

Note: If cleanup activities are conducted by law enforcement personnel, then appropriate hazardous waste cleanup training would be required.

(6) Training course content.

(a) 40 and 80 hour hazardous waste cleanup courses. As a minimum, the training course content for the 40 hour and 80 hour training program shall include the following topics:

(i) Overview of the applicable sections of Part P of chapter 296-62 WAC and the elements of an employer's effective occupational safety and health program.

(ii) Effect of chemical exposure to hazardous substances (i.e., toxicity, carcinogens, irritants, sensitizers, etc.).

(iii) Effects of biological and radiological exposures.

(iv) Fire and explosion hazards (i.e., flammable and combustible liquids, reactive materials).

(v) General safety hazards, including electrical hazards, powered equipment hazards, walking-working surface hazards and those hazards associated with hot and cold temperature extremes.

(vi) Permit-required confined space, tank, and vault hazards and entry procedures.

(vii) Names of personnel and alternates, where appropriate, responsible for site safety and health at the site.

(viii) Specific safety, health, and other hazards that are to be addressed at a site and in the site safety and health plan.

(ix) Use of personal protective equipment and the implementation of the personal protective equipment program.

(x) Work practices that will minimize employee risk from site hazards.

(xi) Safe use of engineering controls and equipment and any new relevant technology or procedure.

(xii) Content of the medical surveillance program and requirements, including the recognition of signs and symptoms of overexposure to hazardous substances.

(xiii) The contents of an effective site safety and health plan.

(xiv) Use of monitoring equipment with "hands-on" experience and the implementation of the employee and site monitoring program.

(xv) Implementation and use of the information program.

(xvi) Drum and container handling procedures and the elements of a spill containment program.

(xvii) Selection and use of material handling equipment.

(xviii) Methods for assessment of risk and handling of radioactive wastes.

(xix) Methods for handling shock-sensitive wastes.

(xx) Laboratory waste pack handling procedures.

(xxi) Container sampling procedures and safeguards.

(xxii) Safe preparation procedures for shipping and transport of containers.

(xxiii) Decontamination program and procedures.

(xxiv) Emergency response plan and procedures including first aid.

(xxv) Safe site illumination levels.

(xxvi) Site sanitation procedures and equipment for employee needs.

(xxvii) Review of the applicable appendices to Part P of chapter 296-62 WAC.

(xxviii) Overview and explanation of WISHA's hazard communication standard Part C of chapter 296-62 WAC.

(xxix) Sources of reference, additional information and efficient use of relevant manuals and hazard coding systems.

(xxx) Principles of toxicology and biological monitoring.

(xxxi) Rights and responsibilities of employees and employers under WISHA and CERCLA.

(xxxii) "Hands-on" field exercises and demonstrations.

(b) 24-hour hazardous waste cleanup course. As a minimum, the 24-hour training course required in WAC 296-62-3040 (3)(c) and (d) for employees engaged in occasional visits to uncontrolled hazardous waste sites shall include the following topics where they are applicable to the job function to be performed:

(i) Overview of applicable sections of Part P of chapter 296-62 WAC and the elements of the employer's effective occupational safety and health program.

(ii) Employee rights and responsibilities under WISHA and CERCLA.

(iii) Overview of relevant chemical exposures to hazardous substances (i.e., toxics, carcinogens, irritants, sensitizers, etc.).

(iv) Overview of the principles of toxicology and biological monitoring.

(v) Use of monitoring equipment with hands-on practice and an overview of a site monitoring program.

(vi) Overview of site hazards including fire and explosion, confined spaces, oxygen deficiency, electrical hazards, powered equipment hazards, walking-working surface hazards.

(vii) The contents of an effective site safety and health plan.

(viii) Use of personal protective equipment and the implementation of the personal protective equipment program.

(ix) Work practices that will minimize employee risk from site hazards.

(x) Site simulations with "hands-on" exercises and practice.

(xi) Emergency response planning and response including first aid.

(xii) Content of the medical surveillance program and requirements, including the recognition of signs and symptoms of overexposure to hazardous substances.

(xiii) Decontamination programs and procedures.

(xiv) Safe use of engineering controls and equipment.

(xv) Sources of references and efficient use of relevant manuals and knowledge of hazard coding systems.

(c) 16-hour supplemental training for hazardous waste sites. As a minimum, employees who have received 24 hours of training for hazardous waste site operations shall receive training in the following topics before they are allowed to work as general site workers or if they are required to wear respirators:

(i) Relevant chemical exposures to hazardous substances beyond that previously covered.

(ii) Site hazards including fire and explosion, confined spaces, oxygen deficiency, electrical, powered equipment, and walking-working surfaces beyond that previously covered.

(iii) Names of personnel and alternates responsible for site safety and health at the site, where appropriate.

(iv) Use of monitoring equipment and the implementation of the employee and the site monitoring program beyond that previously covered.

(v) Implementation and use of the informational program.

(vi) Drum and container handling procedures and the elements of a spill containment program.

(vii) Selection and use of material handling equipment.

(viii) Methods for assessment of risk and handling of radioactive wastes.

(ix) Methods for handling shock-sensitive wastes.

(x) Laboratory waste pack handling procedures.

(xi) Container sampling procedures and safeguards.

(xii) Safe preparation procedures for shipping and transport of containers.

(xiii) Decontamination program and procedures.

(xiv) Safety site illumination levels.

(xv) Site sanitation procedures and equipment.

(xvi) Review of the applicable appendices to Part P of chapter 296-62 WAC.

(xvii) Overview and explanation of WISHA's Hazard communication standard Part C of chapter 296-62 WAC.

(xviii) Sources of reference and additional information.

(d) Additional 8 hours of training for supervisors and managers. Supervisors and managers shall receive an additional eight hours of training in the following subjects:

(i) Management of hazardous wastes and their disposal.

(ii) Federal, state, and local agencies to be contacted in the event of a release of hazardous substances.

(iii) Management of emergency procedures in the event of a release of hazardous substances.

(7) Qualifications for trainers. Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary

for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

(8) Training certification. Employees and supervisors that have received and successfully completed the training and field experience specified in subsections (1) through (4) of this section shall be certified by their instructor or the head instructor and trained supervisor as having successfully completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of subsection (11) of this section shall be prohibited from engaging in hazardous waste operations.

(9) Emergency response. Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to expected emergencies.

(10) Refresher training. Employees specified in subsection (1) of this section, and managers specified in subsection (4) of this section, shall receive eight hours of refresher training annually on the items specified in subsections (2) and/or (4) of this section, any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

(11) Equivalent training. Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in subsections (1) through (4) of this section shall not be required to provide the initial training requirements of those sections to such employees and shall provide a copy of the certification or documentation to the employee upon request. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site work experience. The 80 hours of instruction required can be fulfilled as follows:

(a) Instruction can include a combination of presently available 40 hour training sessions and other related classes or training including additional supervised on-the-job training as long as material covered includes elements required in the training section WAC 296-62-3040(2) of the regulations. A single 80 hour training session is also acceptable.

(b) Previously attended courses including eight-hour refresher courses apply toward the 80 hour requirement and need not be repeated.

(c) Documentation of previous experience and training by qualified trainers is required of employers and must be available to inspectors for review.

(d) When calculating hours of training, WISHA assumes a "normal" work day to be eight hours with sufficient time for lunch and other breaks.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-3040, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-62-3040, filed 11/22/91, effective 12/24/91; 90-20-091 (Order 90-14), § 296-62-3040, filed 10/1/90, effective 11/15/90; 89-21-018 (Order 89-10), § 296-62-3040, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3040, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3170 Appendix B—General description and discussion of the levels of protection and protective gear. (1) This appendix sets forth information about personal protective equipment (PPE) protection levels which may be used to assist employers in complying with the PPE requirements of this section.

(2) As required by the standard, PPE must be selected which will protect employees from the specific hazards which they are likely to encounter during their work on-site.

(3) Selection of the appropriate PPE is a complex process which must take into consideration a variety of factors. Key factors involved in this process are identification of the hazards or suspected hazards, their routes of potential hazard to employees (inhalation, skin absorption, ingestion, and eye or skin contact), and the performance of the PPE materials (and seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific. That is, protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others. In many instances, protective equipment materials cannot be found which will provide continuous protection from the particular hazardous substance. In these cases the breakthrough time of the protective material should exceed the work durations.

(4) Other factors in this selection process to be considered are matching the PPE to the employee's work requirements and task-specific conditions. The durability of PPE materials, such as tear strength and seam strength, must be considered in relation to the employee's tasks. The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE. In some cases layers of PPE may be necessary to provide sufficient protection, or to protect expensive PPE inner garments, suits or equipment.

(5) The more that is known about the hazards at the site, the easier the job of PPE selection becomes. As more information about the hazards and conditions at the site becomes available, the site supervisor can make decisions to up-grade or down-grade the level of PPE protection to match the tasks at hand.

(6) The following are guidelines which an employer can use to begin the selection of the appropriate PPE. As noted above, the site information may suggest the use of combinations of PPE selected from the different protection levels (i.e., A, B, C, or D) as being more suitable to the hazards of the work. It should be cautioned that the listing below does not fully address the performance of the specific PPE material in relation to the specific hazards at the job site, and that PPE selection, evaluation and reselection is an ongoing process until sufficient information about the hazards and PPE performance is obtained.

(7) Personal protective equipment has been divided into four categories based on the degree of protection afforded (see subsection (8) of this section for further explanation of Levels A, B, C, and D hazards):

(a) Level A. To be selected when the greatest level of skin, respiratory, and eye protection is required. The following constitute Level A equipment; it may be used as appropriate:

(i) Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied-air

respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).

(ii) Totally-encapsulating chemical-protective suit.

(iii) Coveralls.*

(iv) Long underwear.*

(v) Gloves, outer, chemical-resistant.

(vi) Gloves, inner, chemical-resistant.

(vii) Boots, chemical-resistant steel toe and shank.

(viii) Hard hat (under suit).*

(ix) Disposable protective suit, gloves, and boots.

(Depending on suit construction, may be worn over totally-encapsulating suit.)

*Optional, as applicable.

(b) Level B. The highest level of respiratory protection is necessary but a lesser level of skin protection is needed. The following constitute Level B equipment; it may be used as appropriate:

(i) Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied-air respirator with escape SCBA (NIOSH approved).

(ii) Hooded chemical-resistant clothing (coveralls and long-sleeved jacket, coveralls, one or two-piece chemical-splash suit, disposable chemical-resistant coveralls).

(iii) Coveralls.*

(iv) Gloves, outer, chemical-resistant.

(v) Gloves, inner, chemical-resistant.

(vi) Boots, outer, chemical-resistant steel toe and shank.

(vii) Boot-covers, outer, chemical-resistant (disposable).*

(viii) Hard hat.

(ix) Face shield.*

*Optional, as applicable.

(c) Level C. The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air purifying respirators are met. The following constitute Level C equipment; it may be used as appropriate.

(i) Full-face or half-mask, air purifying respirators (NIOSH approved).

(ii) Hooded chemical-resistant clothing (coveralls; two-piece chemical-splash suit; disposable chemical-resistant coveralls).

(iii) Coveralls.*

(iv) Gloves, outer, chemical-resistant.

(v) Gloves, inner, chemical-resistant.

(vi) Boots (outer), chemical-resistant steel toe and shank.*

(vii) Boot-covers, outer, chemical-resistant (disposable).*

(viii) Hard hat.

(ix) Escape mask.*

(x) Face shield.*

*Optional, as applicable.

(d) Level D. A work uniform affording minimal protection: Used for nuisance contamination only. The following constitute Level D equipment; it may be used as appropriate.

(i) Coveralls.

(ii) Gloves.*

(iii) Boots/shoes, chemical-resistant steel toe and shank.

(iv) Boots, outer, chemical-resistant (disposable).*

(v) Safety glasses or chemical splash goggles.*

(vi) Hard hat.

(vii) Escape mask.*

(viii) Face shield.*

*Optional, as applicable.

(8) Part B. The types of hazards for which Levels A, B, C, and D protection are appropriate are described below:

(a) Level A - Level A protection should be used when:

(i) The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the intact skin;

(ii) Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible; or

(iii) Operations are being conducted in confined, poorly ventilated areas, and the absence of conditions requiring Level A have not yet been determined.

(b) Level B protection should be used when:

(i) The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection;

(ii) The atmosphere contains less than 19.5 percent oxygen; or

(iii) The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the skin.

Note: This involves atmospheres with IDLH concentrations of specific substances that present severe inhalation hazards and that do not represent a severe skin hazard; or that do not meet the criteria for use of air-purifying respirators.

(c) Level C protection should be used when:

(i) The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin;

(ii) The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants; and

(iii) All criteria for the use of air-purifying respirators are met.

(d) Level D protection should be used when:

(i) The atmosphere contains no known hazard; and

(ii) Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

Note: As stated before combinations of personal protective equipment other than those described for Levels A, B, C, and D protection may be more appropriate and may be used to provide the proper level of protection.

(9) As an aid in selecting suitable chemical protective clothing, it should be noted that the National Fire Protection Association (NFPA) has developed standards on chemical protective clothing. The standards that have been adopted include:

(a) NFPA 1991 - Standard on Vapor-Protective Suits for Hazardous Chemical Emergencies (EPA Level A Protective Clothing);

(b) NFPA 1992 - Standard on Liquid Splash-Protective Suits for Hazardous Chemical Emergencies (EPA Level B Protective Clothing);

(c) NFPA 1993 - Standard on Liquid Splash-Protective Suits for Nonemergency, Nonflammable Hazardous Chemical Situations (EPA Level B Protective Clothing).

(10) These standards apply documentation and performance requirements to the manufacture of chemical protective suits. Chemical protective suits meeting these requirements are labelled as compliant with the appropriate standard. It is recommended that chemical protective suits that meet these standards be used.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-62-3170, filed 1/18/95, effective 3/10/95; 90-20-091 (Order 90-14), § 296-62-3170, filed 10/1/90, effective 11/15/90; 89-21-018, § 296-62-3170, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3170, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3195 Appendix E—Training curriculum guidelines. The following nonmandatory general criteria may be used for assistance in developing site-specific training curriculum used to meet the training requirements of WAC 296-62-3040, 296-62-3140(7), 296-62-3140 (8)(c), 296-62-3112(6), and 296-62-3112(7).

These are generic guidelines and they are not presented as a complete training curriculum for any specific employer. Site-specific training programs must be developed on the basis of a needs assessment of the hazardous waste site, RCRA/TSDF, or emergency response operation in accordance with this chapter (chapter 296-62 WAC, Part P).

The guidance set forth here presents a highly effective program that in the areas covered would meet or exceed the regulatory requirements. In addition, other approaches could meet the regulatory requirements.

Suggested general criteria:

Definitions:

"Competent" means possessing the skills, knowledge, experience, and judgment to perform assigned tasks or activities satisfactorily as determined by the employer.

"Demonstration" means the showing by actual use of equipment or procedures.

"Hands-on training" means training in a simulated work environment that permits each student to have experience performing tasks, making decisions, or using equipment appropriate to the job assignment for which the training is being conducted.

"Initial training" means training required prior to beginning work.

"Lecture" means an interactive discourse with a class lead by an instructor.

"Proficient" means meeting a stated level of achievement.

"Site-specific" means individual training directed to the operations of a specific job site.

"Training hours" means the number of hours devoted to lecture, learning activities, small group work sessions, demonstration, evaluations, or hands-on experience.

Suggested core criteria:

(1) Training facility. The training facility should have available sufficient resources, equipment, and site locations to perform concise and hands-on training when appropriate. Training facilities should have sufficient organization, support staff, and services to conduct training in each of the courses offered.

(2) Training director. Each training program should be under the direction of a training director who is responsible for the program. The training director should have a minimum of two years of employee education experience.

(3) Instructors. Instructors should be deemed competent on the basis of previous documented experience in their area of instruction, successful completion of a "train-the-trainer" program specific to the topics they will teach, and an evaluation of instructional competence by the training director.

(a) Instructors should be required to maintain professional competency by participating in continuing education or professional development programs or by successfully completing an annual refresher course and having an annual review by the training director.

(b) The annual review by the training director should include observation of an instructor's delivery, a review of those observations with the trainer, and an analysis of any instructor or class evaluations completed by the students during the previous year.

(4) Course materials. The training director should approve all course materials to be used by the training provider. Course materials should be reviewed and updated at least annually. Materials and equipment should be in good working order and maintained properly.

(a) All written and audio-visual materials in training curricula should be peer reviewed by technically competent outside reviewers or by a standing advisory committee.

(b) Reviewers should possess expertise in the following disciplines were applicable: Occupational health, industrial hygiene and safety, chemical/environmental engineering, employee education, or emergency response. One or more of the peer reviewers should be an employee experienced in the work activities to which the training is directed.

(5) Students. The program for accepting students should include:

(a) Assurance that the student is or will be involved in work where chemical exposures are likely and that the student possesses the skills necessary to perform the work.

(b) A policy on the necessary medical clearance.

(6) Ratios. Student-instructor ratios should not exceed thirty students per instructor. Hands-on activity requiring the use of personal protective equipment should have the following student-instructor ratios: For Level C or Level D personal protective equipment the ratio should be ten students per instructor. For Level A or Level B personal protective equipment the ratio should be five students per instructor.

(7) Proficiency assessment. Proficiency should be evaluated and documented by the use of a written assessment and a skill demonstration selected and developed by the training director and training staff. The assessment and demonstration should evaluate the knowledge and individual skills developed in the course of training. The level of

minimum achievement necessary for proficiency shall be specified in writing by the training director.

(a) If a written test is used, there should be a minimum of fifty questions. If a written test is used in combination with a skills demonstration, a minimum of twenty-five questions should be used. If a skills demonstration is used, the tasks chosen and the means to rate successful completion should be fully documented by the training director.

(b) The content of the written test or of the skill demonstration shall be relevant to the objectives of the course.

The written test and skill demonstration should be updated as necessary to reflect changes in the curriculum and any update should be approved by the training director.

(c) The proficiency assessment methods, regardless of the approach or combination of approaches used, should be justified, documented and approved by the training director.

(d) The proficiency of those taking the additional courses for supervisors should be evaluated and documented by using proficiency assessment methods acceptable to the training director. These proficiency assessment methods must reflect the additional responsibilities borne by supervisory personnel in hazardous waste operations or emergency response.

(8) Course certificate. Written documentation should be provided to each student who satisfactorily completes the training course. The documentation should include:

- (a) Student's name.
- (b) Course title.
- (c) Course date.
- (d) Statement that the student has successfully completed the course.
- (e) Name and address of the training provider.
- (f) An individual identification number for the certificate.

(g) List of the levels of personal protective equipment used by the student to complete the course.

(i) This documentation may include a certificate and an appropriate wallet-sized laminated card with a photograph of the student and the above information.

(ii) When such course certificate cards are used, the individual identification number for the training certificate should be shown on the card.

(9) Recordkeeping. Training providers should maintain records listing the dates courses were presented, the names of the individual course attendees, the names of those students successfully completing each course, and the number of training certificates issued to each successful student. These records should be maintained for a minimum of five years after the date an individual participated in a training program offered by the training provider. These records should be available and provided upon the student's request or as mandated by law.

(10) Program quality control. The training director should conduct or direct an annual written audit of the training program. Program modifications to address deficiencies, if any, should be documented, approved, and implemented by the training provider. The audit and the program modification documents should be maintained at the training facility.

Suggested Program Quality Control Criteria:

Factors listed here are suggested criteria for determining the quality and appropriateness of employee health and safety training for hazardous waste operations and emergency response.

(1) Training plan. Adequacy and appropriateness of the training program's curriculum development, instructor training, distribution of course materials, and direct student training should be considered, including:

(a) The duration of training, course content, and course schedules/agendas;

(b) The different training requirements of the various target populations, as specified in the appropriate generic training curriculum;

(c) The process for the development of curriculum, which includes appropriate technical input, outside review, evaluation, program pretesting.

(d) The adequate and appropriate inclusion of hands-on, demonstration, and instruction methods;

(e) Adequate monitoring of student safety, progress, and performance during the training.

(2) Program management, training director, staff, and consultants. Adequacy and appropriateness of staff performance and delivering an effective training program should be considered, including:

(a) Demonstration of the training director's leadership in assuring quality of health and safety training;

(b) Demonstration of the competency of the staff to meet the demands of delivering high quality hazardous waste employee health and safety training;

(c) Organization charts establishing clear lines of authority;

(d) Clearly defined staff duties including the relationship of the training staff to the overall program;

(e) Evidence that the training organizational structure suits the needs of the training program;

(f) Appropriateness and adequacy of the training methods used by the instructors;

(g) Sufficiency of the time committed by the training director and staff to the training program;

(h) Adequacy of the ratio of training staff to students;

(i) Availability and commitment of the training program of adequate human and equipment resources in the areas of:

(i) Health effects;

(ii) Safety;

(iii) Personal protective equipment (PPE);

(iv) Operational procedures;

(v) Employee protection practices/procedures;

(j) Appropriateness of management controls;

(k) Adequacy of the organization and appropriate resources assigned to assure appropriate training;

(l) In the case of multiple-site training programs, adequacy of management of the satellite centers.

(3) Training facilities and resources. Adequacy and appropriateness of the facilities and resources for supporting the training program should be considered, including:

(a) Space and equipment to conduct the training;

(b) Facilities for representative hands-on training;

(c) In the case of multiple-site programs, equipment and facilities at the satellite centers;

(d) Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance;

(e) Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action;

(f) Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program;

(g) Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

(4) Quality control and evaluation. Adequacy and appropriateness of quality control and evaluation plans for training programs should be considered, including:

(a) A balanced advisory committee and/or competent outside reviewers to give overall policy guidance;

(b) Clear and adequate definition of the composition and active programmatic role of the advisory committee or outside reviewers;

(c) Adequacy of the minutes or reports of the advisory committee or outside reviewers' meetings or written communication;

(d) Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance;

(e) Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action;

(f) Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program;

(g) Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

(5) Students. Adequacy and appropriateness of the program for accepting students should be considered, including:

(a) Assurance that the student already possess the necessary skills for their job, including necessary documentation;

(b) Appropriateness of methods the program uses to ensure that recruits are capable of satisfactorily completing training;

(c) Review and compliance with any medical clearance policy.

(6) Institutional environment and administrative support. The adequacy and appropriateness of the institutional environment and administrative support system for the training program should be considered, including:

(a) Adequacy of the institutional commitment to the employee training program;

(b) Adequacy and appropriateness of the administrative structure and administrative support.

(7) Summary of evaluation questions. Key questions for evaluating the quality and appropriateness of an overall training program should include the following:

(a) Are the program objectives clearly stated?

(b) Is the program accomplishing its objectives?

(c) Are appropriate facilities and staff available?

(d) Is there an appropriate mix of classroom, demonstration, and hands-on training?

(e) Is the program providing quality employee health and safety training that fully meets the intent of regulatory requirements?

(f) What are the program's main strengths?

(g) What are the program's main weaknesses?

(h) What is recommended to improve the program?

(i) Are instructors instructing according to their training outlines?

(j) Is the evaluation tool current and appropriate for the program content?

(k) Is the course material current and relevant to the target group?

Suggested Training Curriculum Guidelines:

The following training curriculum guidelines are for those operations specifically identified in this Part P, as requiring training. Issues such as qualifications of instructors, training certification, and similar criteria appropriate to all categories of operations addressed in this Part P, have been covered in the preceding section and are not addressed in each of the generic guidelines. Basic core requirements for training programs that are addressed include: (1) *General hazardous waste operations*; (2) *RCRA operations—Treatment, storage, and disposal facilities*; and (3) *Emergency response*.

(1) General hazardous waste operations and site-specific training.

(a) Off-site training. Training course content for hazardous waste operations, required by WAC 296-62-3040, should include the following topics or procedures:

(i) Regulatory knowledge.

(A) A review of this Part P and the core elements of an occupational safety and health program.

(B) The content of a medical surveillance program as outlined in WAC 296-62-3050.

(C) The content of an effective site safety and health plan consistent with the requirements of WAC 296-62-3010 (4)(b).

(D) Emergency response plan and procedures as outlined in WAC 296-24-567 and 296-62-3110.

(E) Adequate illumination.

(F) Sanitation recommendation and equipment.

(G) Review and explanation of WISHA's hazard-communication

standard chapter 296-62 WAC, Part C, and chapter 296-24 WAC, Part A-4, safety procedures for the control of hazardous energy (lockout/tagout).

(H) Review of other applicable standards including but not limited to those in the construction standards, chapter 296-155 WAC.

(I) Rights and responsibilities of employers and employees under applicable WISHA/OSHA and department of ecology (DOE)/Environmental Protection Association (EPA) regulations and laws.

(ii) Technical knowledge.

(A) Type of potential exposures to chemical, biological, and radiological hazards; types of human responses to these hazards and recognition of those responses; principles of toxicology and information about acute and chronic hazards; health and safety considerations of new technology.

(B) Fundamentals of chemical hazards including but not limited to vapor pressure, boiling points, flash points, pH, other physical and chemical properties.

(C) Fire and explosion hazards of chemicals.

(D) General safety hazards such as but not limited to electrical hazards, powered equipment hazards, motor vehicle hazards, walking-working surface hazards, excavation hazards, and hazards associated with working in hot and cold temperature extremes.

(E) Review and knowledge of confined space entry procedures in chapter 296-62 WAC, Part M.

(F) Work practices to minimize employee risk from site hazards.

(G) Safe use of engineering controls, equipment, and any new relevant safety technology or safety procedures.

(H) Review and demonstration of competency with air sampling and monitoring equipment that may be used in a site monitoring program.

(I) Container sampling procedures and safeguarding; general drum and container handling procedures including special requirement for laboratory waste packs, shock-sensitive wastes, and radioactive wastes.

(J) The elements of a spill control program.

(K) Proper use and limitations of material handling equipment.

(L) Procedures for safe and healthful preparation of containers for shipping and transport.

(M) Methods of communication including those used while wearing respiratory protection.

(iii) Technical skills.

(A) Selection, use maintenance, and limitations of personal protective equipment including the components and procedures for carrying out a respirator program to comply with chapter 296-62 WAC Part E, Respiratory Protection.

(B) Instruction in decontamination programs including personnel, equipment, and hardware; hands-on training including Levels A, B, and C ensembles and appropriate decontamination lines; field activities including the donning and doffing of protective equipment to a level commensurate with the employee's anticipated job function and responsibility and to the degree required by potential hazards.

(C) Sources for additional hazard information; exercises using relevant manuals and hazard coding systems.

(iv) Additional suggested items.

(A) A laminated, dated card or certificate with photo, denoting limitations and level of protection for which the employee is trained should be issued to those students successfully completing a course.

(B) Attendance should be required at all training modules, with successful completion of exercises and a final written or oral examination with at least fifty questions.

(C) A minimum of one-third of the program should be devoted to hands-on exercises.

(D) A curriculum should be established for the eight-hour refresher training required by WAC 296-62-4040(10), with delivery of such courses directed toward those areas of previous training that need improvement or reemphasis.

(E) A curriculum should be established for the required eight-hour training for supervisors. Demonstrated competency in the skills and knowledge provided in forty-hour and eighty-hour courses should be prerequisites for supervisor training.

(b) Refresher training. The eight-hour annual refresher training required in WAC 296-62-3040(10) should be conducted by qualified training providers. Refresher training should include at a minimum the following topics and procedures:

(i) Review of and retraining on relevant topics covered in the forty-hour and eighty-hour programs, as appropriate, using reports by the students on their work experiences.

(ii) Update on developments with respect to material covered in the forty-hour and eighty-hour courses.

(iii) Review of changes to pertinent provisions of DOE/EPA or WISHA/OSHA standards or laws.

(iv) Introduction of additional subject areas as appropriate.

(v) Hands-on review of new or altered PPE or decontamination equipment or procedures. Review of new developments in personal protective equipment.

(vi) Review of newly developed air and contaminant monitoring equipment.

(c) On-site training. The employer should provide employees engaged in hazardous waste site activities with information and training prior to initial assignment into their work area, as follows:

(i) The requirements of the hazard communication program including the location and availability of the written program, required lists of hazardous chemicals, and material safety data sheets.

(ii) Activities and locations in their work area where hazardous substance may be present.

(iii) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearances, or other evidence (sight, sound or smell)) of hazardous chemicals being released, and applicable alarms from monitoring devices that record chemical releases.

(iv) The physical and health hazards of substances known or potentially present in the work area.

(v) The measures employees can take to help protect themselves from worksite hazards, including specific procedures the employer has implemented.

(vi) An explanation of the labeling system and material safety data sheets and how employees can obtain and use appropriate hazard information.

(vii) The elements of the confined space program including special PPE, permits, monitoring requirements, communication procedures, emergency response, and applicable lockout procedures.

(d) The employer should provide hazardous waste employees with information and training and should provide a review and access to the site safety and health plan as follows:

(i) Names of personnel and alternate responsible for site safety and health.

(ii) Safety and health hazards present on the site.

(iii) Selection, use, maintenance, and limitations of personal protective equipment specific to the site.

(iv) Work practices by which the employee can minimize risks from hazards.

(v) Safe use of engineering controls and equipment available on site.

(vi) Safe decontamination procedures established to minimize employee contact with hazardous substances, including:

- (A) Employee decontamination;
- (B) Clothing decontamination; and
- (C) Equipment decontamination.

(vii) Elements of the site emergency response plan, including:

- (A) Preemergency planning.
- (B) Personnel roles and lines of authority and communication.
- (C) Emergency recognition and prevention.
- (D) Safe distances and places of refuge.
- (E) Site security and control.
- (F) Evacuation routes and procedures.
- (G) Decontamination procedures not covered by the site safety and health plan.
- (H) Emergency medical treatment and first aid.
- (I) Emergency equipment and procedures for handling emergency incidents.

(e) The employer should provide hazardous waste employees with information and training on personal protective equipment used at the site, such as the following:

(i) PPE to be used based upon known or anticipated site hazards.

(ii) PPE limitations of materials and construction; limitations during temperature extremes, heat stress, and other appropriate medical considerations; use and limitations of respirator equipment as well as documentation procedures as outlined in chapter 296-62 WAC, Part E, Respiratory Protection.

(iii) PPE inspection procedures prior to, during, and after use.

- (iv) PPE donning and doffing procedures.
- (v) PPE decontamination and disposal procedures.
- (vi) PPE maintenance and storage.
- (vii) Task duration as related to PPE limitations.

(f) The employer should instruct the employee about the site medical surveillance program relative to the particular site, including:

(i) Specific medical surveillance programs that have been adapted for the site.

(ii) Specific signs and symptoms related to exposure to hazardous materials on the site.

(iii) The frequency and extent of periodic medical examinations that will be used on the site.

(iv) Maintenance and availability of records.

(v) Personnel to be contacted and procedures to be followed when signs and symptoms of exposures are recognized.

(g) The employees will review and discuss the site safety and health plan as part of the training program. The location of the site safety and health plan and all written programs should be discussed with employees including a discussion of the mechanisms for access, review, and references described.

(2) RCRA operations training for treatment, storage and disposal facilities.

(a) As a minimum, the training course required in WAC 296-62-3140 should include the following topics:

(i) Review of the applicable parts of this Part P and the elements of the employer's occupational safety and health plan.

(ii) Review of relevant hazards such as, but not limited to, chemical, biological, and radiological exposures; fire and explosion hazards; thermal extremes; and physical hazards.

(iii) General safety hazards including those associated with electrical hazards, powered equipment hazards, lockout/tagout procedures, motor vehicle hazards and walking-working surface hazards.

(iv) Confined space hazards and procedures.

(v) Work practices to minimize employee risk from workplace hazards.

(vi) Emergency response plan and procedures including first aid meeting the requirements of WAC 296-62-3140(8).

(vii) A review of procedures to minimize exposure to hazardous waste and various type of waste streams, including the materials handling program and spill containment program.

(viii) A review of hazard communication programs meeting the requirements of chapter 296-62 WAC, Part C.

(ix) A review of medical surveillance programs meeting the requirements of WAC 296-62-3050 and 296-62-3140(3) including the recognition of signs and symptoms of overexposure to hazardous substance including known synergistic interactions.

(x) A review of decontamination programs and procedures meeting the requirements of WAC 296-62-3100 and 296-62-3140(4).

(xi) A review of an employer's requirements to implement a training program and its elements.

(xii) A review of the criteria and programs for proper selection and use of personal protective equipment, including respirators.

(xiii) A review of the applicable appendices to this Part P (Appendices A through E).

(xiv) Principles of toxicology and biological monitoring as they pertain to occupational health.

(xv) Rights and responsibilities of employees and employers under applicable WISHA/OSHA and DOE/EPA regulations and laws.

(xvi) Hands-on exercises and demonstrations of competency with equipment to illustrate the basic equipment principles that may be used during the performance of work duties, including the donning and doffing of PPE.

(xvii) Sources of reference, efficient use of relevant manuals, and knowledge of hazard coding systems to include information contained in hazardous waste manifests.

(xviii) At least eight hours of hands-on training.

(xix) Training in the job skills required for an employee's job function and responsibility before they are permitted to participate in or supervise field activities.

(b) The individual employer should provide hazardous waste employees with information and training prior to an employee's initial assignment into a work area. The training and information should cover the following topics:

(i) The emergency response plan and procedures including first aid.

(ii) A review of the employer's hazardous waste handling procedures including the materials handling program and elements of the spill containment program,

location of spill response kits or equipment, and the names of those trained to respond to releases.

(iii) The hazardous communication program meeting the requirements of chapter 296-62 WAC, Part C.

(iv) A review of the employer's medical surveillance program including the recognition of signs and symptoms of exposure to relevant hazardous substance including known synergistic interactions.

(v) A review of the employer's decontamination program and procedures.

(vi) A review of the employer's training program and the parties responsible for that program.

(vii) A review of the employer's personal protective equipment program including the proper selection and use of PPE based upon specific site hazards.

(viii) All relevant site-specific procedures addressing potential safety and health hazards. This may include, as appropriate, biological and radiological exposures, fire and explosion hazards, thermal hazards, and physical hazards such as electrical hazards, powered equipment hazards, lockout/tagout hazards, motor vehicle hazards, and walking-working surface hazards.

(ix) Safe use of engineering controls and equipment on-site.

(x) Names of personnel and alternates responsible for safety and health.

(3) Emergency response training.

(a) General considerations. Emergency response organizations are required to consider the topics listed in WAC 296-62-3112(6). Emergency response organizations may use some or all of the following topics to supplement those mandatory topics when developing their response training programs. Many of the topics would require an interaction between the response provider and the individuals responsible for the site where the response would be expected.

(i) Hazard recognition, including:

(A) Nature of hazardous substances present;

(B) Practical applications of hazard recognition, including presentations on biology, chemistry, and physics.

(ii) Principles of toxicology, biological monitoring, and risk assessment.

(iii) Safe work practices and general site safety.

(iv) Engineering controls and hazardous waste operations.

(v) Site safety plans and standard operating procedures.

(vi) Decontamination procedures and practices.

(vii) Emergency procedures, first aid, and self-rescue.

(viii) Safe use of field equipment.

(ix) Storage, handling, use and transportation of hazardous substances.

(x) Use, care, and limitations of personal protective equipment.

(xi) Safe sampling techniques.

(xii) Rights and responsibilities of employees under WISHA and other related regulations and laws concerning right-to-know, safety and health, compensations and liability.

(xiii) Medical monitoring requirements.

(xiv) Community relations.

(b) Suggested criteria for specific courses.

(i) First responder awareness level.

(A) Review of and demonstration of competency in performing the applicable skills of WAC 296-62-3112.

(B) Hands-on experience with the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG) and familiarization with chapter 296-62 WAC, Part C, the hazard communication standard.

(C) Review of the principles and practices for analyzing an incident to determine both the hazardous substances present and the basic hazard and response information for each hazardous substance present.

(D) Review of procedures for implementing actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including emergency notification procedures and follow-up communications.

(E) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(F) Awareness and knowledge of the competencies for the First Responder at the Awareness Level covered in the National Fire Protection Association's Standard No. 472, Professional Competence of Responders to Hazardous Materials Incidents.

(ii) First responder operations level.

(A) Review of and demonstration of competency in performing the applicable skills of WAC 296-62-3112.

(B) Hands-on experience with the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, and other relevant sources of information addressing hazardous substance releases. Familiarization with chapter 296-62 WAC, Part C, the hazard communication standard.

(C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles, the types and selection of the appropriate defensive strategy for containing the release.

(D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.

(E) Review of the principles and practice for proper selection and use of personal protective equipment.

(F) Review of the principles and practice of personnel and equipment decontamination.

(G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(H) Awareness and knowledge of the competencies for the First Responder at the Operations Level covered in the National Fire Protection Association's Standard No. 472, Professional Competence of Responders to Hazardous Materials Incidents.

(iii) Hazardous materials technician.

(A) Review of and demonstration of competency in performing the applicable skills of WAC 296-62-3112.

(B) Hands-on experience with written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response models, and other relevant sources of information addressing hazardous substance releases. Familiarization with chapter 296-62 WAC, Part C, the hazard communication standard.

(C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles involved in the release, the appropriate strategy for approaching release sites and containing the release.

(D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.

(E) Review of the principles and practice for proper selection and use of personal protective equipment.

(F) Review of the principles and practices of establishing exposure zones, proper decontamination and medical surveillance stations and procedures.

(G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(H) Awareness and knowledge of the competencies for the Hazardous Materials Technician covered in the National Fire Protection Association's Standard No. 472, Professional Competence of Responders to Hazardous Materials Incidents.

(iv) Hazardous materials specialist.

(A) Review of and demonstration of competency in performing the applicable skills of WAC 296-62-3112.

(B) Hands-on experience with retrieval and use of written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response models, and other relevant sources of information addressing hazardous substance releases. Familiarization with chapter 296-62 WAC, Part C, the hazard communication standard.

(C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, and the likely behavior of the hazardous substance and its container, vessel, or vehicle.

(D) Review of the principles and practices for identification of the types of hazardous substance transportation containers, vessels and vehicles involved in the release; selecting and using the various types of equipment available for plugging or patching transportation containers, vessels or vehicles; organizing and directing the use of multiple teams of hazardous material technicians and selecting the appropriate

strategy for approaching release sites and containing or stopping the release.

(E) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, including knowledge of the available public and private response resources, establishment of an incident command post, direction of hazardous material technician teams, and extended emergency notification procedures and follow-up communications.

(F) Review of the principles and practice for proper selection and use of personal protective equipment.

(G) Review of the principles and practices of establishing exposure zones and proper decontamination, monitoring and medical surveillance stations and procedures.

(H) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(I) Awareness and knowledge of the competencies for the Off-site Specialist Employee covered in the National Fire Protection Association's Standard No. 472, Professional Competence of Responders to Hazardous Materials Incidents.

(v) Incident commander.

The incident commander is the individual who, at any one time, is responsible for and in control of the response effort. This individual is the person responsible for the direction and coordination of the response effort. An incident commander's position should be occupied by the most senior, appropriately trained individual present at the response site. Yet, as necessary and appropriate by the level of response provided, the position may be occupied by many individuals during a particular response as the need for greater authority, responsibility, or training increases. It is possible for the first responder at the awareness level to assume the duties of incident commander until a more senior and appropriately trained individual arrives at the response site.

Therefore, any emergency responder expected to perform as an incident commander should be trained to fulfill the obligations of the position at the level of response they will be providing including the following:

(A) Ability to analyze a hazardous substance incident to determine the magnitude of the response problem.

(B) Ability to plan and implement an appropriate response plan within the capabilities of available personnel and equipment.

(C) Ability to implement a response to favorably change the outcome of the incident in a manner consistent with the local emergency response plan and the organization's standard operating procedures.

(D) Ability to evaluate the progress of the emergency response to ensure that the response objectives are being met safely, effectively, and efficiently.

(E) Ability to adjust the response plan to the conditions of the response and to notify higher levels of response when required by the changes to the response plan.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-62-3195, filed 1/18/95, effective 3/10/95.]

Chapter 296-81 WAC**SAFETY RULES GOVERNING ELEVATORS,
DUMBWAITERS, ESCALATORS AND OTHER
LIFTING DEVICES—MOVING WALKS****WAC**

296-81-007	National Elevator Code adopted.
296-81-306	Door protective and reopening device.
296-81-350	Door jamb marking.

WAC 296-81-007 National Elevator Code adopted.

(1) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks, American National Standards Institute A17.1, as amended or revised through 1971, is adopted as the standards in this state for elevators, dumbwaiters, escalators, and moving walks installed from February 25, 1972, through June 30, 1982.

(2) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1981 edition, is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after July 1, 1982 through January 9, 1986.

(3) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1984 edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 10, 1986, with the exception of ANSI A17.1, part XIX. For all elevators, dumbwaiters, escalators, and moving walks installed on or after November 1, 1988, the requirements of ANSI A17.1, 1984 edition apply, with the exception of ANSI A17.1, part XIX and ANSI A17.1, part II, Rule 211.3b, which is replaced by WAC 296-81-275.

(4) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1987 edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 1, 1989, with the exception of ANSI A17.1, part XIX, and ANSI A17.1, part II, Rule 211.3b, which is replaced by WAC 296-81-275.

(5) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1990 Edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 1, 1993, with the exceptions of ANSI A17.1, Part XIX, and ANSI A17.1, Part V, Section 513, which is replaced by chapter 296-94 WAC.

(6) The American National Standard Safety Code For Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1993 Edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after March 1, 1995, with the exceptions of ANSI A17.1, Part XIX, and ANSI A17.1, Part V, Section 513, which is replaced by chapter 296-94 WAC.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-81-007, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-007, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-19-053 (Order 88-18), § 296-81-007, filed 9/15/88. Statutory Authority: RCW 70.87.030. 87-23-007 (Order 87-21), § 296-81-007, filed 11/6/87. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-024 (Order 86-1), § 296-81-007, filed 1/10/86. Statutory Authority: RCW 70.87.030 and 70.87.185. 84-23-001 (Order 84-21), § 296-81-007, filed 11/8/84.]

Statutory Authority: RCW 70.87.185 and 70.87.034. 84-05-005 (Order 83-37), § 296-81-007, filed 2/6/84. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-007, filed 5/20/82; Order 72-2, § 296-81-007, filed 2/25/72.]

WAC 296-81-306 Door protective and reopening device. Doors closed by automatic means shall be provided with a door reopening device which will function to stop and reopen a car door and adjacent hoistway door in case the car door is obstructed while closing. This reopening device shall also be capable of sensing an object or person in the path of a closing door without requiring contact for activation at a nominal 5 and 29 inches above the floor.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-81-306, filed 1/18/95, effective 3/1/95.]

WAC 296-81-350 Door jamb marking. The floor designation shall be provided at each hoistway entrance on both sides of jamb visible from within the car and the elevator lobby at a centerline height of (60) inches above the floor. Designations shall be on contrasting color background (2) inches high and raised (.03) inch, and shall be accompanied by Grade 2 Braille. Applied plates permanently attached shall be acceptable.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-81-350, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-350, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-350, filed 12/10/80.]

Chapter 296-86 WAC**REGULATIONS AND FEES FOR FREIGHT AND
PASSENGER ELEVATORS, MANLIFTS,
DUMBWAITERS, ESCALATORS, MOVING
WALKS, AUTOMOBILE PARKING ELEVATORS,
PERSONNEL ELEVATORS, AND OTHER LIFTING
DEVICES****WAC**

296-86-060	Annual operating permit fees.
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WAC 296-86-060 Annual operating permit fees. Fees for annual operation shall be paid in accordance with the following schedule and no operating permit shall be issued for the operation of a conveyance until such fees have been received.

CONVEYANCE	ANNUAL FEE
Each hydraulic elevator	\$ 70.00
Each cable elevator	90.00
	plus \$7.00 for
	each hoistway opening
	in excess of two.
Each cable elevator traveling	
more than 25 ft.	10.00 for each 25 ft.
without opening	of travel without openings.
Each sidewalk freight elevator	70.00
Each hand power freight elevator	45.00
Each hand power manlift	45.00
Each incline elevator in other than a	
private residence	90.00
Each belt manlift	70.00
Each boat launching elevator	70.00
Each auto parking elevator	70.00

Each escalator	70.00
Each moving walk	70.00
Each dumbwaiter in other than a private residence	45.00
Each people mover	60.00
Each stair lift in other than a private residence	45.00
Each wheel chair lift in other than a private residence	45.00
Each personnel elevator	70.00
Each material hoist	70.00
Each casket lift	70.00
Each inclined stairway chair lift in private residence	15.00
Each inclined wheelchair lift in private residence	20.00
Each vertical wheelchair lift in private residence	25.00
Each inclined elevator at a private residence	70.00
Each dumbwaiter in private residence	20.00
Each private residence elevator	45.00
Each private residence elevator installed with variance in other than a private residence	70.00

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-86-060, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-86-060, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-026 (Order 86-5), § 296-86-060, filed 1/10/86. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-86-060, filed 5/20/82; Order 76-37, § 296-86-060, filed 12/3/76; Order 74-36, § 296-86-060, filed 10/1/74; Order 71-16, § 296-86-060, filed 12/7/71; Order 70-11, § 296-86-060, filed 9/18/70, effective 10/21/70; Order 70-5, § 296-86-060, filed 6/2/70.]

Chapter 296-95 WAC

ELECTRIC ELEVATORS—DIRECT PLUNGER AND ROPED HYDRAULIC ELEVATORS—ESCALATORS USED TO TRANSPORT PASSENGERS—ELECTRIC AND HAND-POWERED DUMBWAITERS AND HAND-POWERED ELEVATORS

WAC

296-95-130	Access to pits.
296-95-272	Electrical protective devices.
296-95-318	Pump relief valve.

WAC 296-95-130 Access to pits. Means of access for authorized personnel shall be provided to all pits. Access doors, if provided, shall be kept closed and locked. Access ladders shall be installed in elevator pits 3 feet and deeper.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-95-130, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-130, filed 12/1/92, effective 1/1/93.]

WAC 296-95-272 Electrical protective devices. Electrical protective devices shall be provided in accordance with the following:

(1) Slack-rope switch. Winding drum machines shall be provided with a slack-rope device equipped with a slack-rope switch of the enclosed manually rest type which shall cause the electric power to be removed from the elevator driving machine motor and brake if the suspension ropes become slack.

(2) Motor-generator running switch. Where generator-field control is used, means shall be provided to prevent the application of power to the elevator driving machine motor and brake unless the motor generator set connections are properly switched for the running condition of the elevator. It is not required that the electrical connections between the

elevator driving machine motor and the generator be opened in order to remove power from the elevator motor.

(3) Compensating rope sheave switch. Compensating rope sheaves shall be provided with a compensating rope sheave switch or switches mechanically opened by the compensating rope sheave before the sheave reaches its upper or lower limit of travel to cause the electric power to be removed from the elevator driving machine motor and brake.

(4) Broken rope, tape, or chain switches used in connection with machine room normal terminal stopping switches. Broken rope, tape, or chain switches conforming to the requirements of WAC 296-95-236 shall be provided in connection with normal terminal stopping devices located in machine rooms of traction elevators. Such switches shall be opened by a failure of the rope, tape, or chain.

(5) Stop switch on top of car. A stop switch shall be provided on the top of every elevator car, which shall cause the electric power to be removed from the elevator driving machine motor and brake, and:

- (a) Be of the manually operated and closed type;
- (b) Have red operating handles or buttons;
- (c) Be conspicuously and permanently marked "stop" and shall indicate the stop and run positions;
- (d) Be positively opened mechanically (opening shall not be solely dependent on springs).

(6) Car-safety mechanism switch. A switch shall be required where a car safety is provided.

(7) Speed governor overspeed switch. A speed governor overspeed switch shall be provided when required by WAC 296-95-236.

(8) Final terminal stopping devices. Final terminal stopping devices shall be provided for every elevator.

(9) Emergency terminal speed limiting device. Where reduced stroke oil buffers are provided, emergency terminal speed limiting devices are required.

(10) Motor generator overspeed protection. Means shall be provided to cause the electric power to be removed automatically from the elevator driving machine motor and brake should a motor generator set, driven by a direct current motor, overspeed excessively.

(11) Motor field sensing means. Where direct current is supplied to an armature and shunt field of an elevator driving machine motor, a motor field current sensing means shall be provided, which shall cause the electric power to be removed from the motor armature and brake unless current is flowing in the shunt field of the motor.

A motor field current sensing means is not required for static control elevators provided with a device to detect an overspeed condition prior to, and independent of, the operation of the governor overspeed switch. This device shall cause power to be removed from the elevator driving machine motor armature and machine brake.

(12) Buffer switches for oil buffers used with Type C car safeties. Oil level and compression switches shall be provided for all oil buffers used with Type C safeties.

(13) Hoistway door interlocks or hoistway door electric contacts. Hoistway door interlocks or hoistway door electric contacts shall be provided for all elevators.

(14) Car door or gate electric contacts. Car door or gate electric contacts shall be provided for all elevators.

(15) Normal terminal stopping devices. Normal terminal stopping devices shall be provided for every elevator.

(16) Car side emergency exit electric contact. An electric contact shall be provided on every car side emergency exit door.

(17) Electric contacts for hinged car platform sills. Hinged car platform sills, where provided, shall be equipped with electric contacts.

(18) Stop switch in elevator pit. A stop switch shall be installed in all elevator pits. It shall be located between 36 in. to 48 in. above the bottom landing floor, and accessible from outside the hoistway.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-95-272, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-272, filed 12/1/92, effective 1/1/93.]

WAC 296-95-318 Pump relief valve. (1) Pump relief valve required. Each pump or group of pumps shall be equipped with a relief valve conforming to the following requirements, except as covered by subsection (2) of this section:

(a) Type and location. The relief valve shall be located between the pump and the check valve and shall be of such a type and so installed in the by-pass connection that the valve cannot be shut off from the hydraulic system.

(b) Setting. The relief valve shall be preset to open at a pressure not greater than one hundred twenty-five percent of working pressure.

(c) Size. The size of the relief valve and by-pass shall be sufficient to pass the maximum rated capacity of the pump without raising the pressure more than twenty percent above that at which the valve opens. Two or more relief valves may be used to obtain the required capacity.

(d) Sealing. Relief valves having exposed pressure adjustments, if used, shall have their means of adjustment sealed after being set to the correct pressure.

(2) Pump relief valve not required. No relief valve is required for centrifugal pumps driven by induction motors, provided the shutoff, or maximum pressure which the pump can develop, is not greater than one hundred thirty-five percent of the working pressure at the pump.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-95-318, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-318, filed 12/1/92, effective 1/1/93.]

Chapter 296-104 WAC

BOARD OF BOILER RULES—SUBSTANTIVE

WAC

296-104-015	Administration—Board meetings.
296-104-020	Administration—Filing requirements before installation.
296-104-025	Administration—Owner to notify chief inspector of accidents.
296-104-030	Administration—Penalty for operation of unsafe boilers or unfired pressure vessels.
296-104-035	Administration—Conflict of interests.
296-104-040	Administration—Inspector's inspection reports.
296-104-045	Administration—Insurance companies' responsibilities.
296-104-100	Inspection—Frequency of inspections.
296-104-105	Inspection—Notification of inspection.

296-104-110	Inspection—Unsafe or defective boilers or unfired pressure vessels.
296-104-115	Inspection—Defective conditions concealed by covering.
296-104-120	Repealed.
296-104-130	Inspection—Validity of inspection certificate.
296-104-135	Inspection—Restamping of boilers and unfired pressure vessels.
296-104-140	Inspection—State stamp.
296-104-145	Inspection of systems.
296-104-150	Inspection—Unfired steam boilers.
296-104-155	Inspection—Preparation for internal inspection.
296-104-160	Inspection—Boilers or unfired pressure vessels improperly prepared for inspection.
296-104-165	Inspection—Removal of covering to permit inspection.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-104-120	Inspection—Condemned boilers or unfired pressure vessel. [Statutory Authority: RCW 70.79.040. 91-11-107, § 296-104-120, filed 5/22/91, effective 6/22/91; Part III, § 5, filed 3/23/60.] Repealed by 95-19-058, filed 9/15/95, effective 10/16/95. Statutory Authority: RCW 70.79.030 and 70.79.040.
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WAC 296-104-015 Administration—Board meetings. The board of boiler rules shall hold its regular meetings in January, March, May, September and November of each year. The time, place, and date of each regular meeting shall be set by the chairman of the board and published annually. Special meetings may be called by the chairman when considered necessary by the board. The chief inspector will serve as secretary to the board without vote.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-015, filed 9/15/95, effective 10/16/95. Statutory Authority: RCW 70.79.040. 91-11-107, § 296-104-015, filed 5/22/91, effective 6/22/91. Statutory Authority: RCW 70.79.050. 90-07-082, § 296-104-015, filed 3/21/90, effective 4/21/90. Statutory Authority: RCW 70.79.040 and 70.79.050. 86-01-088 (Order 85-26), § 296-104-015, filed 12/19/85; Order 72-11, § 296-104-015, filed 7/7/72.]

WAC 296-104-020 Administration—Filing requirements before installation. Manufacturers data reports on boilers and pressure vessels as required by the provisions of the ASME Code shall be filed by the owner or his agent with the chief inspector or the National Board of Boiler and Pressure Vessel Inspectors before installation. When the boilers or pressure vessel are of special design or construction not covered by the ASME Code (unless otherwise exempted by the rules and regulations), the owner or user shall apply to the board of boiler rules in writing for permission to install such boilers or pressure vessels and shall supply such details of design and construction as may be required by the board of boiler rules and approval shall be secured before construction is started. When second hand boilers or pressure vessels are to be reinstalled, the owner or user shall file a data report or construction details, as required, and secure approval from the chief inspector before starting installation.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-020, filed 9/15/95, effective 10/16/95; Order 74-37, § 296-104-020, filed 11/8/74; Part II, § 1, filed 3/23/60.]

WAC 296-104-025 Administration—Owner to notify chief inspector of accidents. When an accident occurs which renders a boiler or unfired pressure vessel inoperative, the owner or user shall immediately notify the chief inspector, and submit a detailed report of the accident. In cases of serious accidents, such as explosions or those resulting in personal injury, notice to the chief inspector shall be given immediately by telephone or electronic means designed to assure its earliest possible receipt. Neither the boiler or unfired pressure vessel nor any parts thereof shall be removed or disturbed before an inspection has been made by the chief inspector, or his designee except for the purpose of saving life or limiting consequential damage. The inspector making the investigation and inspection shall report to the chief inspector as soon as possible. The boiler or pressure vessel owner shall be responsible for all costs of the department's investigation.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-025, filed 9/15/95, effective 10/16/95; Part II, § 2, filed 3/23/60.]

WAC 296-104-030 Administration—Penalty for operation of unsafe boilers or unfired pressure vessels. In the event that a boiler or unfired pressure vessel is unsafe to operate, the inspection certificate shall be suspended. Any person, firm, partnership, or corporation causing such objects to be operated under pressure without a valid certificate of inspection shall be in violation of RCW 70.79.320 and subject to the penalties specified in WAC 296-104-701.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-030, filed 9/15/95, effective 10/16/95; Part II, § 3, filed 3/23/60.]

WAC 296-104-035 Administration—Conflict of interests. Inspectors commissioned by the state of Washington shall not engage in the sale of any service, article, or device or promote any other activity for personal gain relating to boilers or unfired pressure vessels or their appurtenances.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-035, filed 9/15/95, effective 10/16/95; Part II, § 4, filed 3/23/60.]

WAC 296-104-040 Administration—Inspector's inspection reports. Inspectors shall submit reports of inspections of boilers and unfired pressure vessels on appropriate forms approved by the chief inspector. Routine reports of inspections shall be submitted within thirty days of inspection. Reports of reinspection after suspension of an inspection certificate shall be submitted by an inspector employed by the in-service inspection agency as soon as notice of corrective action has been received so that the vessel certificate can be reinstated and the boiler or unfired pressure vessel lawfully operated.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-040, filed 9/15/95, effective 10/16/95; Order 74-37, § 296-104-040, filed 11/8/74; Part II, § 5, filed 3/23/60.]

WAC 296-104-045 Administration—Insurance companies' responsibilities. All insurance companies shall notify the chief inspector within thirty days of all boiler or unfired pressure vessel risks written, canceled, not renewed or suspended because of unsafe conditions. Special inspec-

tors shall perform all in-service inspections of boilers and unfired pressure vessels insured by their employer. After a repair or alteration the in-service inspector is responsible to assure an R-1 form is completed and submitted to the department.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-045, filed 9/15/95, effective 10/16/95; Part II, § 6, filed 3/23/60.]

WAC 296-104-100 Inspection—Frequency of inspections. Power boilers shall be inspected annually both internally and externally while not under pressure, and annually externally while under pressure, except organic vapor boilers which shall be internally inspected biennially and externally annually.

Low pressure heating boilers shall be inspected externally biennially. They shall in addition be inspected internally biennially except where construction does not permit an internal inspection or those nonvapor boilers using glycol, oil, or adequately treated with a corrosion inhibitor. In addition to the required external inspection, low pressure steam boilers shall, as a minimum, have a biennial internal inspection of their low water fuel cutoff.

Unfired pressure vessels shall be inspected externally biennially. Where subject to corrosion and construction permits they shall in addition be inspected internally biennially or at intervals established in accordance with the NBIC or API-510 when utilized by an owner/user inspection agency.

When internal intervals are extended by an owner/user inspection agency, based on the NBIC or API-510, ultrasonic examination is required at the biennial external certificate inspection.

Unfired pressure vessels not subject to internal corrosion shall be inspected externally biennially.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-100, filed 9/15/95, effective 10/16/95. Statutory Authority: RCW 70.79.040. 94-21-002, § 296-104-100, filed 10/5/94, effective 11/5/94; Part III, § 1, filed 3/23/60.]

WAC 296-104-105 Inspection—Notification of inspection. The owner or user shall prepare each boiler and unfired pressure vessel for internal inspection and shall prepare for and apply a hydrostatic pressure test whenever necessary on the date specified by the inspector. Seven days will be considered sufficient notification.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-105, filed 9/15/95, effective 10/16/95; Part III, § 2, filed 3/23/60.]

WAC 296-104-110 Inspection—Unsafe or defective boilers or unfired pressure vessels. If an inspector, upon inspection of a boiler or unfired pressure vessel or appurtenances finds hazardous conditions such that it is unsafe to operate under pressure, remedial action shall be initiated at once. A red tag indicating "unsafe - do not use" shall be attached to the principle operating control and the owner or user advised that further operation is prohibited until specified repairs or other action are taken. The chief inspector shall be notified immediately, followed by a report on the condition. Any certificate in force is considered suspended. When reinspection establishes that necessary repairs have been made or corrective action taken so that the

boiler or unfired pressure vessel is safe to operate, a report of reinspection shall be submitted to the chief inspector. The certificate of inspection will then be reinstated or a new certificate issued as appropriate.

If other defects, but not unsafe conditions, are found, a routine inspection report containing a noncompliance report shall be submitted to the chief inspector and the owner or user allowed to operate the object for a period as specified by the inspector until corrective action is completed.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-110, filed 9/15/95, effective 10/16/95; Part III, § 3, filed 3/23/60.]

WAC 296-104-115 Inspection—Defective conditions concealed by covering. If upon an external inspection there is evidence of a leak or crack, enough of the covering of the boiler or unfired pressure vessel shall be removed to satisfy the inspector in order that he/she may determine as to the safety of the boiler or unfired pressure vessel, or if the covering cannot be removed at the time, he may order the operation of the boiler or unfired pressure vessel stopped until such time as the covering can be removed and proper examination made.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-115, filed 9/15/95, effective 10/16/95; Part III, § 4, filed 3/23/60.]

WAC 296-104-120 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-104-130 Inspection—Validity of inspection certificate. An inspection certificate, issued in accordance with RCW 70.79.290, shall be valid until expiration unless some defect or condition affecting the safety of the boiler or unfired pressure vessel is disclosed or the conditions of RCW 70.79.300 apply.

When portable unfired pressure vessels are inspected and certified by the state or the city jurisdictions of Spokane, Seattle or Tacoma, the certificates will be considered valid certificates provided they are posted on or near the vessel, and provided there is an agreement between that city and the state.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-130, filed 9/15/95, effective 10/16/95; Part III, § 7, filed 3/23/60.]

WAC 296-104-135 Inspection—Restamping of boilers and unfired pressure vessels. When the stamping on a boiler or unfired pressure vessel becomes indistinct the inspector shall instruct the owner or user to have it restamped. Request for permission to restamp the boiler or unfired pressure vessel shall be made to the chief inspector and proof of the original stamping shall accompany the request. Restamping authorized by the chief inspector shall be done only in the presence of an inspector, and shall be identical with the original stamping except that it will not be required to restamp the ASME symbol. Notice of completion of such restamping shall be filed with the chief boiler inspector by the inspector who witnessed the restamping of the boiler or unfired pressure vessel together with a facsimile of the stamping applied.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-135, filed 9/15/95, effective 10/16/95; Part III, § 8, filed 3/23/60.]

WAC 296-104-140 Inspection—State stamp. Upon completion of the installation, all boilers and unfired pressure vessels shall be inspected by the chief inspector, a deputy inspector, or a special inspector. At the time of this inspection, each boiler or unfired pressure vessel shall be marked with a serial number of the state of Washington followed by the letter "W," said letter and figures to be not less than 5/16 in. in height. The marking shall not be concealed by lagging or paint and shall be exposed at all times.

Data sheets shall be made available at the time of first inspection if not filed with the national board.

Washington special numbers when assigned by the chief inspector shall be preceded by the letters: WS.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-140, filed 9/15/95, effective 10/16/95; Order 73-1, § 296-104-140, filed 3/22/73; Part III, § 9, filed 3/23/60.]

WAC 296-104-145 Inspection of systems. A group of unfired pressure vessels operating as a single unit such as the vessels in a refrigeration system, evaporators, ironers and paper machines may be given one number, designating the different vessels of the unit as a-b-c, etc. The inspector's report shall cover all pressure vessels in the system individually. One certificate shall be issued for the unit. Certificate charge shall be as outlined in RCW 70.79.290, for each vessel of the system.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-145, filed 9/15/95, effective 10/16/95; Part III, § 10, filed 3/23/60.]

WAC 296-104-150 Inspection—Unfired steam boilers. Unfired steam boilers operating at pressures of 50 psi or more shall be inspected as power boilers. Unfired steam boilers operating at less than 50 psi shall be inspected as unfired pressure vessels.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-150, filed 9/15/95, effective 10/16/95; Part III, § 11, filed 3/23/60.]

WAC 296-104-155 Inspection—Preparation for internal inspection. The owner or user shall prepare a boiler for internal inspection in the following manner or as required by the inspector:

(a) Water shall be drawn off and the boiler thoroughly washed.

(b) All manhole and handhole plates and wash-out plugs and water column connections shall be removed, the furnace and combustion chambers thoroughly cooled and cleaned.

(c) All grates of internally fired boilers shall be removed.

(d) At each annual inspection brickwork shall be removed as required by the inspector in order to determine the condition of the boiler headers, furnace, supports, or other parts.

(e) The steam gauge shall be removed for testing or evidence of testing shown.

(f) Any leakage of steam or hot water into the boiler shall be cut off by disconnecting the pipe or valve at the most convenient point.

(g) The low water cutout shall be disassembled to such a degree as the inspector shall require.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-155, filed 9/15/95, effective 10/16/95; Part III, § 12, filed 3/23/60.]

WAC 296-104-160 Inspection—Boilers or unfired pressure vessels improperly prepared for inspection. If a boiler or unfired pressure vessel has not been properly prepared for an internal inspection, or the owner or user fails to comply with the requirements for hydrostatic test as set forth in these rules, the inspector may decline to make the inspection or test and the certificate of inspection shall be withheld until the owner or user complies with the requirements.

Unfired pressure vessels shall be prepared for inspection to the extent deemed necessary by the inspector.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-160, filed 9/15/95, effective 10/16/95; Part III, § 13, filed 3/23/60.]

WAC 296-104-165 Inspection—Removal of covering to permit inspection. If the boiler or unfired pressure vessel is jacketed so that the longitudinal seams of shells, drums, or domes cannot be seen, enough of the jacketing, setting wall, or other form of casing or housing shall be removed so that the size of the rivets, pitch of the rivets, and other data necessary to determine the safety of the boiler or unfired pressure vessel may be obtained provided such information cannot be determined by other means.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-165, filed 9/15/95, effective 10/16/95; Part III, § 14, filed 3/23/60.]

Chapter 296-115 WAC

SAFETY REQUIREMENTS FOR CHARTER BOATS

WAC

296-115-015 Definitions applicable to all sections of this chapter.

WAC 296-115-015 Definitions applicable to all sections of this chapter.

Note: Meaning of words. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

"Approved" - approved by the director; however, if a provision of this chapter states that approval by an agency or organization other than the department such as nationally recognized testing laboratories or the United States Coast Guard is required, then approval by the specified authority shall be accepted.

"Authorized person" - a person approved or assigned by the employer to perform a specific type of duty or duties or be at a specific location or locations at the workplace.

"Bare boat" charter means the unconditional lease, rental, or charter of a boat by the owner, or his or her agent, to a person who by written agreement, or contract, assumes all responsibility and liability for the operation, navigation, and provisioning of the boat during the term of the agreement or contract, except when a captain or crew is required or provided by the owner or owner's agents to be hired by the charterer to operate the vessel.

"Carrying passengers or cargo" means the transporting of any person or persons or cargo on a vessel for a fee or other consideration.

"CFR" - Code of Federal Regulations.

"Charter boat" means a vessel or barge operating on inland navigable waters of the state of Washington which is not inspected or licensed by the United States Coast Guard and over which the United States Coast Guard does not exercise jurisdiction and which is rented, leased, or chartered to carry more than six persons or cargo.

"Commercial" - any activity from which the operator, or the person chartering, renting, or leasing a vessel derives a profit, and/or which qualifies as a legitimate business expense under the Internal Revenue Statutes.

"Competent person" - one who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt action to eliminate them.

"Confined space" - means a space that:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and

(3) Is not designed for continuous employee occupancy.

"Defect" - any characteristic or condition that tends to weaken or reduce the strength of the tool, object, or structure of which it is a part.

"Department" - the department of labor and industries.

"Director" - the director of the department of labor and industries, or his/her designated representative.

"Employer" - any person, firm, corporation, partnership, business trust, legal representative, or other business entity that operates a passenger vessel for hire in this state and employs one or more employees or contracts with one or more persons, the essence of which is the personal labor of such persons. Any person, partnership, or business entity that has no employees, and is covered by the Industrial Insurance Act shall be considered both an employer and an employee.

"Enclosed space" - means any space, other than a confined space, which is enclosed by bulkheads and overhead. It includes cargo holds, tanks, quarters, and machinery and boiler spaces.

"Equipment" means a system, part, or component of a vessel as originally manufactured, or a system, part, or component manufactured or sold for replacement, repair, or improvement of a system, part, or component of a vessel; an accessory or equipment for, or appurtenance to a vessel; or a marine safety article, accessory, or equipment, including radio equipment, intended for use by a person on board a vessel.

"Hazard" - a condition, potential or inherent, that is likely to cause injury, death, or occupational disease.

"Hazardous substance" - a substance that, because it is explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful, is likely to cause death or injury, including all substances listed on the USCG hazardous materials list.

"Inspection" - the examination of vessels by the director or an authorized representative of the director.

"Marine and dock section" - the chief and staff of the marine and dock section, department of labor and industries.

"Passenger" - any person or persons, carried on board a vessel in consideration of the payment of a fee or other consideration.

"Port" - left hand side of a vessel as one faces the bow.

"Starboard" - right hand side of a vessel as one faces the bow.

"Power driven vessel" - any vessel propelled by machinery.

"Qualified" - one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve problems relating to the subject matter, the work, or the project.

"Safety factor" - the ratio of the ultimate breaking strength of a member or piece of material or equipment to the actual working stress or safe load when in use.

"Safety and health standard" - a standard that requires the adoption or use of one or more practices, means, methods, operations, or processes reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

"Shall" - the provision of the standard is mandatory.

"Should" - recommended.

"Substantial" - constructed of such strength, of such material, and of such workmanship, that the object referred to will withstand all normal wear, shock, and usage.

"Standard safeguard" - a device intended to remove a hazard incidental to the machine, appliance, tool, or equipment to which the device is attached.

Standard safeguards shall be constructed of either metal, wood, other suitable material, or a combination of these. The final determination of the sufficiency of any safeguard rests with the director.

"Suitable" - that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

"Under way" - a vessel is not at anchor, or made fast to the shore, or aground.

"USCG" - United States Coast Guard.

"United States Coast Guard Navigation" - rules International/Inland, Commandants Instruction M16672.29 as now adopted, or hereafter legally amended by the United States Coast Guard.

"Vessel" means every description of motorized watercraft, other than a bare boat charter boat, seaplane, or sailboat, used or capable of being used to transport more than six passengers or cargo on water for rent, lease, or hire.

"Working day" - a calendar day, except Saturdays, Sundays, and legal holidays as set forth in RCW 1.16.050, as now or hereafter amended. The time within which an act is to be done under the provisions of this chapter shall be computed by excluding the first working day and including the last working day.

"Worker," "personnel," "man," "person," "employee," and other terms of like meaning, unless the context indicates otherwise - an employee of an employer who is employed in the business of his/her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an

independent contract the essence of which is his/her personal labor for an employer whether by manual labor or otherwise.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-115-015, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-115-015, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-115-015, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-015, filed 11/13/80.]

Chapter 296-116 WAC PILOTAGE RULES

WAC

296-116-185	Tariffs, and pilotage rates for the Grays Harbor pilotage district.
296-116-300	Pilotage rates for the Puget Sound pilotage district.

WAC 296-116-185 Tariffs, and pilotage rates for the Grays Harbor pilotage district.

CLASSIFICATION OF PILOTAGE SERVICE RATE

Piloting of vessels in the inland waters and tributaries of Grays Harbor:

Each vessel shall be charged according to its draft and tonnage. The draft charges shall be \$55.95 per meter (or \$17.02 per foot) and the tonnage charge shall be \$0.1784 per net registered ton. The minimum net registered tonnage charge is \$624.27. The charge for an extra vessel (in case of tow) is \$356.74.

Boarding fee:

Per each boarding/deboarding from a boat \$269.15

Harbor shifts:

For each shift from dock to dock, dock to anchorage, anchorage to dock, or anchorage to anchorage \$447.50
Delays per hour \$106.71
Cancellation charge (pilot only) \$178.36
Cancellation charge (pilot boat only) . . \$535.09

Travel allowance:

Boarding or debarking a vessel off Grays Harbor entrance \$82.82
Pilot when traveling to an outlying port to join a vessel or returning through an outlying port from a vessel which has been piloted to sea shall be paid \$624.28 for each day or fraction thereof, and the travel expense incurred \$624.28

Bridge transit:

Charge for each bridge transited \$195.90

Miscellaneous:

The balance of amounts due for pilotage rates not paid within 30 days of invoice

will be assessed at 1 1/2% per month late charge.

Adopted 6-8-95
 Filed 6-16-95
 Effective [K]0001 Hours 8-1-95 through 2400 Hours 7-31-96

[Statutory Authority: RCW 88.16.035. 95-13-054, § 296-116-185, filed 6/16/95, effective 8/1/95; 94-05-006, § 296-116-185, filed 2/3/94, effective 3/6/94; 93-13-055, § 296-116-185, filed 6/16/93, effective 7/17/93; 93-03-080, § 296-116-185, filed 1/19/93, effective 2/19/93; 92-14-069, § 296-116-185, filed 6/26/92, effective 7/27/92; 91-08-008, § 296-116-185, filed 3/26/91, effective 4/26/91; 90-09-013, § 296-116-185, filed 4/6/90, effective 5/7/90; 89-08-042 (Order 89-3, Resolution No. 89-3), § 296-116-185, filed 3/31/89; 88-05-043 (Order 88-2, Resolution No. 88-2), § 296-116-185, filed 2/17/88, effective 3/21/88. Statutory Authority: RCW 88.16.035(4). 87-01-081 (Orders 86-9 and 86-10, Resolution Nos. 86-9 and 86-10), § 296-116-185, filed 12/19/86; 85-02-048 (Order 84-5, Resolution No. 84-5), § 296-116-185, filed 12/31/84; 83-15-012 (Order 83-3, Resolution No. 83-3), § 296-116-185, filed 7/12/83; 82-08-016 (Order 82-1, Resolution No. 82-1), § 296-116-185, filed 3/29/82; 81-07-009 (Order 81-1, Resolution No. 81-1), § 296-116-185, filed 3/6/81; 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-185, filed 3/4/80; Order 2-68, § 296-116-185, filed 11/1/68.]

Reviser's note: RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

WAC 296-116-300 Pilotage rates for the Puget Sound pilotage district. Effective 0001 hours July 1, 1995, through 2400 hours June 30, 1996.

CLASSIFICATION	RATE
Ship length overall (LOA)	
Charges:	per LOA rate schedule in this section
Boarding fee:	\$ 35.00
Per each boarding/deboarding at the Port Angeles pilot station.	
Harbor shift - Live ship (Seattle Port)	LOA Zone I
Harbor shift - Live ship (other than Seattle Port)	LOA Zone I
Harbor shift - Dead ship	Double LOA
Dead ship towing charge:	Zone I
LOA of tug + LOA of tow + beam of tow	Double LOA
Any tow exceeding seven hours, two pilots are mandatory.	Zone
Harbor shifts shall constitute and be limited to those services in moving vessels from dock to dock, from anchorage to dock, from dock to anchorage, or from anchorage to anchorage in the same port after all other applicable tariff charges for pilotage services have been recognized as payable.	
Waterway and bridge charges:	
Ships up to 90' beam:	
A charge of \$187.00 shall be in addition to bridge fees for any vessel movements both inbound and outbound required to transit south of Spokane Street Bridge in Seattle, south of Eleventh Street Bridge in any of the Tacoma waterways, in Port Gamble, or in the Snohomish River. Any vessel movements required to transit through bridges shall have an additional charge of \$89.00 per bridge.	
Ships 90' beam and/or over:	
A charge of \$251.00 shall be in addition to bridge fees for any vessel movements both inbound and outbound required to transit south of Spokane Street Bridge in Seattle and south of Eleventh Street Bridge in any of the Tacoma waterways. Any vessel	

movements required to transit through bridges shall have an additional charge of \$176.00 per bridge.

(The above charges shall not apply to transit of vessels from Shilshole Bay to the limits of Lake Washington.)

Two or three pilots required:

In a case where two or three pilots are employed for a single vessel waterway or bridge transit, the second and/or third pilot charge shall include the bridge and waterway charge in addition to the harbor shift rate.

Compass adjustment	\$250.00
Radio direction finder calibration	\$250.00
Launching vessels	377.00
Trial trips, 6 hours or less (Minimum \$708.00)	\$118.00 per hr.
Trial trips, over 6 hours (two pilots)	\$236.00 per hr.
Shilshole Bay — Salmon Bay	\$147.00
Salmon Bay — Lake Union	\$115.00
Lake Union — Lake Washington (plus LOA zone from Webster Point)	\$147.00
Cancellation charge	LOA Zone I
Cancellation charge — Port Angeles (when a pilot is ordered and vessel proceeds to a port outside the Puget Sound pilotage district without stopping for pilot or when a pilot order is cancelled less than twelve hours prior to the original ETA.)	LOA Zone II
Docking delay after anchoring:	\$118.00 per hr.
Applicable harbor shift rate to apply, plus \$118.00 per hour standby. No charge if delay is 60 minutes or less. If the delay is more than 60 minutes, charge is \$118.00 for every hour or fraction thereof.	
Sailing delay:	\$118.00 per hour
No charge if delay is 60 minutes or less. If the delay is more than 60 minutes, charge is \$118.00 for every hour or fraction thereof.	
Slowdown:	\$118.00 per hour
When a vessel chooses not to maintain its normal speed capabilities for reasons determined by the vessel and not the pilot, and when the difference in arrival time is one hour, or greater, from the predicted arrival time had the vessel maintained its normal speed capabilities, a charge of \$118.00 per hour, and each fraction thereof, will be assessed for the resultant difference in arrival time.	
Super ships:	
20,000 to 50,000 gross tons:	
Additional charge to LOA zone mileage of \$0.0608 a gross ton for all gross tonnage in excess of 20,000 gross tons up to 50,000 gross tons.	
50,000 gross tons and up:	
In excess of 50,000 gross tons, the charge shall be \$0.0727 per gross ton.	
For vessels where a certificate of international gross tonnage is required, the appropriate international gross tonnage shall apply.	
Delayed arrival-Port Angeles:	\$118.00 per hour
When a pilot is ordered for an arriving inbound vessel at Port Angeles and the vessel does not arrive within two hours of its ETA, or its ETA is amended less than six hours prior to the original ETA, a charge of \$118.00 for each hour delay, or fraction thereof, shall be assessed in addition to all other appropriate charges.	

When a pilot is ordered for an arriving inbound vessel at Port Angeles and the ETA is delayed to six hours or more beyond the original ETA, a cancellation charge shall be assessed, in addition to all other appropriate charges, if the ETA was not amended at least twelve hours prior to the original ETA.

Transportation to vessels on Puget Sound:

March Point or Anacortes	\$144.00
Bangor	84.00
Bellingham	158.00
Bremerton	44.00
Cherry Point	175.00
Dupont	85.00
Edmonds	27.00
Everett	52.00
Ferndale	173.00
Manchester	66.00
Mukilteo	52.00
Olympia	108.00
Point Wells	27.00
Port Gamble	77.00
Port Townsend (Indian Island)	109.00
Seattle	15.00
Semiahmoo (Blaine)	196.00
Tacoma	56.00
Tacoma Smelter	66.00
Winslow	42.00

- (a) Intraharbor transportation for the Port Angeles port area - transportation between Port Angeles pilot station and Port Angeles harbor docks - \$15.00.
- (b) Interport shifts: Transportation paid to and from both points.
- (c) Intraharbor shifts: Transportation to be paid both ways. If intraharbor shift is cancelled on or before scheduled reporting time, transportation paid one way only.
- (d) Cancellation: Transportation both ways unless notice of cancellation is received prior to scheduled reporting time in which case transportation need only be paid one way.
- (e) Any new facilities or other seldom used terminals, not covered above, shall be based on mileage x \$1.80 per mile.

Delinquent payment charge: 1 1/2% per month after 45 days from first billing.

Nonuse of pilots: Ships taking and discharging pilots without using their services through all Puget Sound and adjacent inland waters shall pay full pilotage fees on the LOA zone mileage basis from Port Angeles to destination, from place of departure to Port Angeles, or for entire distance between two ports on Puget Sound and adjacent inland waters.

LOA rate schedule

The following rate schedule is based upon distances furnished by National Oceanic and Atmospheric Administration, computed to the nearest half-mile and includes retirement fund contributions.

LOA	ZONE I	ZONE II	ZONE III	ZONE IV	ZONE V	ZONE VI
	Intra Harbor	0-30 Miles	31-50 Miles	51-75 Miles	76-100 Miles	101 Miles & Over
Up to 449	176	275	478	715	966	1256
450 - 459	182	282	481	726	981	1262
460 - 469	186	285	488	738	996	1266
470 - 479	191	293	494	753	999	1269
480 - 489	196	299	496	768	1005	1275
490 - 499	199	302	502	781	1016	1281
500 - 509	209	307	511	791	1024	1290
510 - 519	212	314	516	802	1035	1294
520 - 529	215	325	524	806	1044	1306
530 - 539	223	330	531	815	1061	1319
540 - 549	226	335	542	824	1078	1331
550 - 559	230	345	546	837	1085	1344

560 - 569	238	359	556	844	1097	1358
570 - 579	244	363	560	847	1108	1366
580 - 589	255	370	573	854	1115	1381
590 - 599	266	377	576	858	1131	1396
600 - 609	275	388	584	861	1144	1403
610 - 619	292	392	594	865	1157	1416
620 - 629	303	397	601	875	1169	1432
630 - 639	319	405	608	877	1178	1445
640 - 649	332	414	614	880	1191	1456
650 - 659	355	422	625	887	1205	1470
660 - 669	362	426	630	891	1217	1482
670 - 679	375	437	637	906	1231	1490
680 - 689	381	446	645	917	1242	1506
690 - 699	392	453	654	933	1256	1536
700 - 719	410	467	667	942	1279	1554
720 - 739	435	481	684	956	1306	1581
740 - 759	453	502	698	966	1331	1609
760 - 779	471	521	713	981	1358	1630
780 - 799	494	543	726	996	1381	1659
800 - 819	514	560	741	1001	1403	1683
820 - 839	531	579	758	1016	1432	1704
840 - 859	554	604	772	1028	1456	1734
860 - 879	574	625	787	1056	1482	1757
880 - 899	594	644	802	1080	1506	1783
900 - 919	612	663	816	1106	1536	1810
920 - 939	631	684	837	1131	1554	1832
940 - 959	654	702	848	1157	1581	1856
960 - 979	670	723	863	1178	1609	1883
980 - 999	694	741	878	1205	1630	1907
1000 & over	713	766	893	1231	1659	1933

[Statutory Authority: RCW 88.16.035. 95-12-018, § 296-116-300, filed 5/30/95, effective 7/1/95; 94-12-044, § 296-116-300, filed 5/27/94, effective 7/1/94; 93-12-133, § 296-116-300, filed 6/2/93, effective 7/3/93; 92-14-007, § 296-116-300, filed 6/19/92, effective 7/20/92; 91-11-074, § 296-116-300, filed 5/20/91, effective 6/20/91; 90-20-116, § 296-116-300, filed 10/2/90, effective 11/2/90; 90-08-095, § 296-116-300, filed 4/4/90, effective 5/5/90; 89-08-041 (Order 89-2, Resolution No. 89-2), § 296-116-300, filed 3/31/89. Statutory Authority: RCW 88.16.050. 88-05-039 (Order 88-1, Resolution No. 88-1), § 296-116-300, filed 2/16/88, effective 3/18/88. Statutory Authority: RCW 88.16.035(4). 87-01-081 (Orders 86-9 and 86-10, Resolution Nos. 86-9 and 86-10), § 296-116-300, filed 12/19/86; 86-19-066 (Order 86-6, Resolution No. 86-6), § 296-116-300, filed 9/16/86; 86-02-035 (Order 86-1, Resolution No. 86-1), § 296-116-300, filed 12/30/85; 85-02-048 (Order 84-5, Resolution No. 84-5), § 296-116-300, filed 12/31/84; 84-04-006 (Order 84-1, Resolution No. 84-1), § 296-116-300, filed 1/20/84; 83-17-055 (Order 83-6, Resolution No. 83-6), § 296-116-300, filed 8/17/83; 82-13-065 (Order 82-4, Resolution No. 82-4), § 296-116-300, filed 6/16/82. Statutory Authority: RCW 88.16.035. 81-12-017 (Order 81-2, Resolution No. 81-2), § 296-116-300, filed 5/29/81; 80-06-084 (Order 80-1, Resolution No. 80-1), § 296-116-300, filed 5/28/80. Statutory Authority: RCW 88.16.035(4). 79-07-033 (Order 79-4, Resolution No. 79-4), § 296-116-300, filed 6/19/79. Statutory Authority: Chapter 88.16 RCW and 1977 ex. sess. c 337, §§ 1 and 4. 78-02-008 (Order 78-1), § 296-116-300, filed 1/6/78, effective 2/10/78; Order 77-18, § 296-116-300, filed 9/20/77, effective 11/1/77; Order 76-24, § 296-116-300, filed 7/22/76; Order 75-3, § 296-116-300, filed 2/10/75; Order 74-2, § 296-116-300, filed 1/8/74; Order 73-8, § 296-116-300, filed 6/20/73 and Emergency Order 73-10, filed 7/19/73, effective 8/14/73; Order 70-7, § 296-116-300, filed 7/16/70; 7/25/67; 2/18/64; 10/29/62; 12/28/60; 3/23/60.]

Chapter 296-155 WAC

**SAFETY STANDARDS FOR CONSTRUCTION
WORK**

WAC

296-155-012	Definitions applicable to all sections of this chapter.
296-155-100	Management's responsibility.
296-155-20301	Definitions.
296-155-245	Scope and application.
296-155-24501	Definitions.
296-155-24503	Duty to have full fall protection.
296-155-24505	Fall protection systems criteria and practices.
296-155-24507	Training requirements.

296-155-24510	Reserved
296-155-24515	Reserved.
296-155-24519	Appendix A to Part C-1—Determining roof widths nonmandatory guidelines for complying with WAC 296-155-24503 (2)(j).
296-155-24520	Appendix B to Part C-1—Guardrail systems nonmandatory guidelines for complying with WAC 296-155-24505(2).
296-155-24521	Appendix C to Part C-1—Personal fall arrest systems nonmandatory guidelines for complying with WAC 296-155-24505(4).
296-155-24522	Appendix D to Part C-1—Positioning device systems nonmandatory guidelines for complying with WAC 296-155-24505(6).
296-155-24523	Appendix E to Part C-1—Sample fall protection plan nonmandatory guidelines for complying with WAC 296-155-24505(12).
296-155-24524	Appendix F to Part C-1, fall restraint and fall arrest (employer information only).
296-155-24525	Reserved.
296-155-325	General requirements for storage.
296-155-407	Protective clothing.
296-155-477	Stairways.
296-155-480	Ladders.
296-155-485	Scaffolding.
296-155-48531	Vehicle mounted elevating and rotating aerial devices.
296-155-48533	Crane or derrick suspended personnel platforms.
296-155-500	Reserved.
296-155-505	Reserved.
296-155-50503	Reserved.
296-155-515	Reserved.
296-155-525	Cranes and derricks.
296-155-527	Appendix A to WAC 296-155-525.
296-155-655	General protection requirements.
296-155-682	Requirements for equipment and tools.
296-155-715	Bolting, riveting, fitting-up, and plumbing-up.
296-155-730	Tunnels and shafts.
296-155-740	Cofferdams.
296-155-745	Compressed air.

WAC 296-155-012 Definitions applicable to all sections of this chapter.

Note: Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section. Certain parts of this chapter contain definitions as they apply to that particular part.

"Approved" means approved by the director of the department of labor and industries or his/her authorized representative: *Provided, however*, That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the bureau of mines, the provisions of WAC 296-155-006 shall apply.

"Assistant director" means the individual in charge of the division of consultation and compliance, department of labor and industries, or an authorized representative.

"Authorized person" means a person approved or assigned by the employer to perform a specific type of duty or duties or be at a specific location or locations at the workplace.

"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective action to eliminate them.

"Confined space" means a space that:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and

(3) Is not designed for continuous employee occupancy. "Construction work" shall mean and include all or any part of excavation, construction, erection, alteration, repair, demolition, and dismantling, of buildings and other structures and all operations in connection therewith; the excavation, construction, alteration and repair of sewers, trenches, caissons, conduits, pipe lines, roads and all operations pertaining thereto; the moving of buildings and other structures, and to the construction, alteration, repair, or removal of wharfs, docks, bridges, culverts, trestles, piers, abutments or any other construction, alteration, repair or removal work related thereto.

"Defect" means any characteristic or condition which tends to weaken or reduce the strength of the tool, object, or structure of which it is a part.

"Department" means the department of labor and industries.

"Designated person" means "authorized person" as defined in this section.

"Director" means the director of the department of labor and industries, or his/her designated representative.

"Division" means the division of consultation and compliance of the department.

"Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: *Provided*, that any person, partnership, or business entity not having employees, and who is covered by the industrial insurance act shall be considered both an employer and an employee.

"Equipment" means all machinery, devices, tools, facilities, safeguards, and protective construction used in connection with construction operations.

"Ground fault circuit interrupter" means a fast acting circuit breaker that is sensitive to very low levels of current leakage to ground. The device is designed to limit the electric shock to a current and time duration below that which can cause serious injury.

"Hazard" means that condition, potential or inherent, which is likely to cause injury, death, or occupational disease.

"Hazardous substance" means a substance which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful, is likely to cause death or injury.

"Maintenance" means the work of keeping a building, machine, roadway, etc., in a state of good repair.

"Part" means a major division, of this chapter, relating to a specific topic or topics and containing various sections, subsections, etc.

"Permit-required confined space (permit space)" means a confined space that has one or more of the following characteristics:

- (1) Contains or has a potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- (4) Contains any other recognized serious safety or health hazard.

"Qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to the subject matter, the work, or the project.

"Repair" means to restore a building, machine, road-way, etc., to an original state after damage or decay.

"Safety factor" means the ratio of the ultimate breaking strength of a member or piece of material or equipment to the actual working stress or safe load when in use.

"Safety and health standard" means a standard which requires the adoption or use of one or more practices, means, methods, operations, or processes reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

"Shall" means that the provision(s) of the standard are mandatory.

"Substantial" means constructed of such strength, of such material, and of such workmanship, that the object referred to will withstand all normal wear, shock and usage.

"Standard safeguard" means a device designed and constructed with the object of removing the hazard of accident incidental to the machine, appliance, tool, building, or equipment to which it is attached.

Standard safeguards shall be constructed of either metal or wood or other suitable material or a combination of these. The final determination of the sufficiency of any safeguard rests with the director of the department of labor and industries through the division of consultation and compliance.

"Suitable" means that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

"Working day" means a calendar day, except Saturdays, Sundays, and legal holidays as set forth in RCW 1.16.050, as now or hereafter amended, and for the purposes of the computation of time within which an act is to be done under the provisions of this chapter, shall be computed by excluding the first working day and including the last working day.

"Worker," "personnel," "man," "person," "employee," and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, mean an employee of an employer who is employed in the business of their employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is their personal labor for an employer whether by manual labor or otherwise.

"Work place" means any plant, yard, premises, room, or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control, and includes, but is not limited to, all work places covered by industrial insurance under Title 51 RCW, as now or hereafter amended.

Abbreviations used in this chapter:

"ANSI" means American National Standards Institute.

"API" means American Petroleum Institute.

"ASA" means American Standards Association.

"ASAE" means American Society of Agricultural Engineers.

"ASHRE" means American Society of Heating and Refrigeration Engineers.

"ASME" means American Society of Mechanical Engineers.

"ASTM" means American Society of Testing and Materials.

"AWS" means American Welding Society.

"BTU" means British thermal unit.

"BTUH" means British thermal unit per hour.

"CFM" means cubic feet per minute.

"CFR" means Code of Federal Register.

"CGA" means Compressed Gas Association.

"CIE" means Commission Internationale de l'Eclairage.

"DOT" means department of transportation.

"FRP" means fiberglass reinforced plastic.

"GPM" means gallons per minute.

"ICC" means Interstate Commerce Commission.

"ID" means inside diameter.

"LPG" means liquefied petroleum gas.

"MCA" means Manufacturing Chemist Association.

"MSHA" means United States Department of Labor, Mine Safety and Health Administration.

"NBFU" means National Board of Fire Underwriters.

"NEMA" means National Electrical Manufacturing Association.

"NFPA" means National Fire Protection Association.

"NTP" means normal temperature and pressure.

"OD" means outside diameter.

"PSI" means pounds per square inch.

"PSIA" means pounds per square inch absolute.

"PSIG" means pounds per square inch gauge.

"RMA" means Rubber Manufacturers Association.

"SAE" means Society of Automotive Engineers.

"TFI" means The Fertilizer Institute.

"TSC" means Trailer Standard Code.

"UL" means Underwriters' Laboratories, Inc.

"USASI" means United States of America Standards Institute.

"USC" means United States Code.

"USCG" means United States Coast Guard.

"WAC" means Washington Administrative Code.

"WISHA" means Washington Industrial Safety and Health Act of 1973.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-012, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-012, filed 1/21/86; Order 74-26, § 296-155-012, filed 5/7/74, effective 6/6/74.]

WAC 296-155-100 Management's responsibility.

(1) It shall be the responsibility of management to establish, supervise, and enforce, in a manner which is effective in practice:

(a) A safe and healthful working environment.

(b) An accident prevention program as required by these standards.

(c) Training programs to improve the skill and competency of all employees in the field of occupational safety and health.

(2) Employees required to handle or use poisons, caustics, and other harmful substances shall be instructed regarding the safe handling and use, and be made aware of the potential hazards, personal hygiene, and personal protective measures required.

(3) In job site areas where harmful plants or animals are present, employees who may be exposed shall be instructed regarding the potential hazards, and how to avoid injury, and the first aid procedures to be used in the event of injury.

(4) Employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific requirements contained in Parts B, D, and other applicable parts of this standard.

(5) Permit-required confined spaces. The requirements of chapters 296-24, 296-62 and 296-155 WAC apply.

(6) The employer shall ensure that work assignments place no employee in a position or location not within ordinary calling distance of another employee able to render assistance in case of emergency.

Note: This subsection does not apply to operators of motor vehicles, watchpersons or other jobs which, by their nature, are single employee assignments. However, a definite procedure for checking the welfare of all employees during working hours should be instituted and all employees so advised.

(7) Each employer shall post and keep posted a notice or notices (Job Safety and Health Protection - Form F416-081-000) to be furnished by the department of labor and industries, informing employees of the protections and obligations provided for in the act and that for assistance and information, including copies of the act, and of specific safety and health standards employees should contact the employer or the nearest office of the department of labor and industries. Such notice or notices shall be posted by the employer at each establishment in a conspicuous place or places where notices to employees are customarily posted. Each employer shall take steps to assure that such notices are not altered, defaced, or covered by other material.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-100, filed 1/18/95, effective 3/1/95; 94-15-096 (Order 94-07), § 296-155-100, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-100, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-100, filed 1/21/86; Order 76-6, § 296-155-100, filed 3/1/76; Order 74-26, § 296-155-100, filed 5/7/74, effective 6/6/74.]

WAC 296-155-20301 Definitions. Confined space means a space that:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults,

and pits are spaces that may have limited means of entry); and

(3) Is not designed for continuous employee occupancy.

"Corrosives" means substances which in contact with living tissue cause destruction of the tissue by chemical action.

"Hazardous atmosphere" means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

(1) Flammable gas, vapor, or mist in excess of ten percent of its lower flammable limit (LFL);

(2) Airborne combustible dust at a concentration that meets or exceeds its LFL;

Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet (1.52m) or less.

(3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

(4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in chapter 296-62 WAC, general occupational health standards, and which could result in employee exposure in excess of its dose or permissible exposure limit;

Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

(5) Any other atmospheric condition that is immediately dangerous to life or health.

Note: For air contaminants for which WISHA has not determined a dose or permissible exposure limit, other sources of information, such as material safety data sheets that comply with the Hazard Communication Standard, chapter 296-62 WAC, Part C, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

"Irritants" means substances which on immediate, prolonged, or repeated contact with normal living tissue will induce a local inflammatory reaction.

"Oxygen deficient atmospheres" means atmospheres at sea level having less than 19.5% oxygen by volume or having a partial pressure of 148 millimeters of mercury or less. This may deviate when working at higher altitudes and should be determined for an individual location. Factors such as acclimatization, physical condition of persons involved, etc., must be considered for such circumstances and conditions. (See chapter 296-62 WAC, Part M, permit-required confined spaces.)

"Toxicants" means substances which have the inherent capacity to produce personal injury or illness to persons by absorption through any body surface.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-155-20301, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-20301, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-155-20301, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-20301, filed 1/21/86.]

WAC 296-155-245 Scope and application. (1) Chapter 296-155 WAC, Part C-1 sets forth requirements for employers to provide and enforce the use of fall protection

for employees in construction, alteration, repair, maintenance (including painting and decoration), demolition workplaces, and material handling covered under chapter 296-155 WAC.

Exception: The provisions of this part do not apply when employees are making an inspection, investigation, or assessment of workplace conditions prior to the actual start of construction work or after all construction work has been completed.

(2) WAC 296-155-24503 sets forth those workplaces, conditions, operations, and circumstances for which fall protection shall be provided except requirements relating to fall protection for employees engaged in the construction of electric transmission and distribution lines and equipment are provided in chapter 296-45 WAC.

(3) WAC 296-155-24505 sets forth the requirements for the installation, construction, and proper use of fall protection required by chapter 296-155 WAC, except as follows:

(a) Performance requirements for guardrail systems used on scaffolds and performance requirements for falling object protection used on scaffolds are provided in Part J-1, of chapter 296-155 WAC.

(b) Performance requirements for stairways, stairwell systems, and handrails are provided in Part J of chapter 296-155 WAC.

(c) Additional performance requirements for personal climbing equipment, lineman's body belts, safety straps, and lanyards are provided in chapter 296-45 WAC.

(4) WAC 296-155-24507 sets forth requirements for training in the installation and use of fall protection systems.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-245, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24501 Definitions. Anchorage means a secure point of attachment for lifelines, lanyards or deceleration devices which is capable of withstanding the forces specified in the application sections of chapter 296-155 WAC.

Body belt means a Type 1 safety belt used in conjunction with lanyard or lifeline for fall restraint only.

Body harness means straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Buckle means any device for holding the body belt or body harness closed around the employee's body.

Competent person means an individual knowledgeable of fall protection equipment, including the manufacturer's recommendations and instructions for the proper use, inspection, and maintenance; and who is capable of identifying existing and potential fall hazards; and who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

Connector means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system (such as a buckle or dee-ring sewn into a body belt or body harness, or

a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).

Controlled access zone (CAZ) means an area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.

Dangerous equipment means equipment (such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment, and other units) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.

Deceleration device means any mechanism, such as a rope grab, rip-stitch lanyard, specially woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Deceleration distance means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

Equivalent means alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Fall protection work plan means a written planning document in which the employer identifies all areas on the job site where a fall hazard of 10 feet or greater exists. The plan describes the method or methods of fall protection to be utilized to protect employees, and includes the procedures governing the installation, use, inspection, and removal of the fall protection method or methods which are selected by the employer. (See WAC 296-155-24505.)

Note: See WAC 296-155-24505(12) for a fall protection plan when conventional fall protection is infeasible to provide for leading edge, precast concrete erection work, or residential construction work.

Fall-restraint system means an approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level. When standard guardrails are selected, compliance with applicable sections governing their construction and use shall constitute approval.

Free fall means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free fall distance means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard delonga-

tion, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before the operate and fall arrest forces occur.

Guardrail system means a barrier erected to prevent employees from falling to lower levels.

Hole means a gap or void 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface.

Infeasible means that it is impossible to perform the construction work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.

Lanyard means a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

Leading edge means the edge of a floor, roof, or form work for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or form work sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.

Lifeline means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorage's at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall protection system to the anchorage.

Low-slope roof means a roof having a slope less than or equal to 4 in 12 (vertical to horizontal).

Lower levels means those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.

Mechanical equipment means all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mopcars.

Opening means a gap or void 30 inches (76 cm) or more high and 18 inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.

Overhand bricklaying and related work means the process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. Related work includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.

Personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, or harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

Personal fall restraint system means a system used to prevent an employee from falling. It consists of anchorage's, connectors, body belt/harness. It may include, lanyards, lifelines and rope grabs designed for the purpose.

Positioning device system means a body belt or body harness system rigged to allow an employee to be supported

on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

Rope grab means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Roof means the exterior surface on the top of a building. This does not include floors or form work which, because a building has not been completed, temporarily become the top surface of a building.

Roofing work means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

Safety monitor system means a system of fall restraint used in conjunction with a warning line system only, where a competent person as defined by this part, having no additional duties, monitors the proximity of workers to the fall hazard when working between the warning line and the unprotected sides and edges, including, the leading edge of a low-sloped roof or walking/working surface.

Self-retracting lifeline/lanyard means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

Snap-hook means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap-hooks are generally one of two types:

- The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or
- The nonlocking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a nonlocking snap-hook as part of personal fall arrest systems and positioning device systems is prohibited.

Steep roof means a roof having a slope greater than 4 in 12 (vertical to horizontal).

Toeboard means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Unprotected sides and edges means any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches (1.0 m) high.

Walking/working surface means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

Warning line system means a barrier erected on a walking and working surface or a low-slope roof (4 in 12 or

less), to warn employees that they are approaching an unprotected fall hazard(s).

Work area means that portion of a walking/working surface where job duties are being performed.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24501, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24501, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24503 Duty to have full fall protection. (1) General.

(a) This section sets forth requirements for employers to provide fall protection systems. All fall protection required by this section shall conform to the criteria set forth in WAC 296-155-24505.

(b) The employer shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.

(2) Unprotected sides and edges.

(a) Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 4 feet (1.2m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest/fall-restraint systems.

(b) Leading edges.

(i) Each employee who is constructing a leading edge 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, or personal fall arrest/fall-restraint systems.

Exception: When working between a height six (1.8m) and ten (3.05) feet above the adjacent floor or ground and the employer can demonstrate that it is infeasible or creates a greater hazard to use these systems, the employer shall develop and implement a fall protection plan which meets the requirements of WAC 296-155-24505(12).

Note: There is a presumption that it is feasible and will not create a greater hazard to implement at least one of the above-listed fall protection systems. Accordingly, the employer has the burden of establishing that it is appropriate to implement a fall protection plan which complies with WAC 296-155-24505(12) for a particular workplace situation, in lieu of implementing any of those systems.

(ii) Each employee on a walking/working surface 4 feet (1.2m) or more above a lower level where leading edges are under construction, but who is not engaged in the leading edge work, shall be protected from falling by a guardrail system, safety net system, or personal fall arrest system. If a guardrail system is chosen to provide the fall protection, and a controlled access zone has already been established for leading edge work, the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.

(c) Hoist areas. Each employee in a hoist area shall be protected from falling 4 feet (1.2m) or more to lower levels by guardrail systems, fall restraint, or personal fall arrest systems. If guardrail systems, (or chain, gate, or guardrail) or portions thereof, are removed to facilitate the hoisting operation (e.g., during landing of materials), and an employ-

ee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example), that employee shall be protected from fall hazards by a personal fall arrest system.

(d) Holes.

(i) Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) by personal fall arrest systems, covers, or guardrail systems erected around such holes.

(ii) Each employee on a walking/working surface shall be protected from tripping in or stepping into or through holes (including skylights) by covers.

(iii) Each employee on a walking/working surface shall be protected from objects falling through holes (including skylights) by covers.

(e) Form work and reinforcing steel. Each employee on the face of form work or reinforcing steel shall be protected from falling 6 feet (1.8 m) or more to lower levels by personal fall arrest/fall restraint systems, safety net systems, or positioning device systems.

(f) Ramps, runways, and other walkways.

(i) Each employee on ramps, runways, and other walkways shall be protected from falling 4 feet (1.2m) or more to lower levels by guardrail systems.

(ii) Width. Ramps, runways, and inclined walkways shall be at least eighteen inches wide.

(iii) Ramp specifications. Ramps, runways and walkways shall not be inclined more than twenty degrees from horizontal and when inclined shall be cleated or otherwise treated to prevent a slipping hazard on the walking surface.

(g) Excavations.

(i) Each employee at the edge of an excavation 4 feet (1.2m) or more in depth shall be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barrier;

(ii) Each employee at the edge of a well, pit, shaft, and similar excavation 4 feet (1.2m) or more in depth shall be protected from falling by guardrail systems, fences, barricades, or covers.

(h) Regardless of height, open-sided floors, walkways, platforms or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units and similar hazards, shall be guarded with a standard railing and toeboard.

(i) Overhand bricklaying and related work.

(i) Except as otherwise provided in subsection (2) of this section, each employee performing overhand bricklaying and related work 6 feet (1.8 m) or more above lower levels, shall be protected from falling by guardrail systems, safety net systems, personal fall arrest systems, or shall work in a controlled access zone.

(ii) Each employee reaching more than 10 inches (25 cm) below the level of the walking/working surface on which they are working, shall be protected from falling by a guardrail system, safety net system, or personal fall arrest/fall-restraint system.

Note: Bricklaying operations performed on scaffolds are regulated by Part J-1, Scaffolding, of this chapter.

(j) Roofing work on low-slope roofs. Each employee engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, personal fall arrest/restraint systems, or a combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest system, or warning line system and safety monitoring system. Or, on roofs 50 feet (15.25 m) or less in width (see Appendix A to this Part), the use of a safety monitoring system alone (i.e. without the warning line system) is permitted.

(k) Steep roofs. Each employee on a steep roof with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems with toeboards, safety net systems, or personal fall arrest/restraint systems.

(l) Precast concrete erection. Each employee engaged in the erection of precast concrete members (including, but not limited to, the erection of wall panels, columns, beams, and floor and roof "tees") and related operations such as grouting of precast concrete members, who is 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, or personal fall arrest/restraint systems, unless another provision in subsection (2) of this section provides for an alternative fall protection measure.

Exception: When the employer can demonstrate that it is infeasible or creates a greater hazard to use these systems, the employer shall develop and implement a fall protection plan which meets the requirements of WAC 296-155-24505(12).

Note: There is a presumption that it is feasible and will not create a greater hazard to implement at least one of the above-listed fall protection systems. Accordingly, the employer has the burden of establishing that it is appropriate to implement a fall protection plan which complies with WAC 296-155-24505(12) for a particular workplace situation, in lieu of implementing any of those systems.

(m) Residential construction. Each employee engaged in residential construction activities 6 feet (1.8 m) or more above lower levels shall be protected by guardrail systems, safety net systems, or personal fall arrest/restraint systems unless another provision in subsection (2) of this section provides for an alternative fall protection measure.

Exception: When the employer can demonstrate that it is infeasible or creates a greater hazard to use these systems, the employer shall develop and implement a fall protection plan which meets the requirements of WAC 296-155-24505(12).

Note: There is a presumption that it is feasible and will not create a greater hazard to implement at least one of the above-listed fall protection systems. Accordingly, the employer has the burden of establishing that it is appropriate to implement a fall protection plan which complies with WAC 296-155-24505(12) for a particular workplace situation, in lieu of implementing any of those systems.

(n) Wall openings. Each employee working on, at, above, or near wall openings including those with chutes attached, where the outside bottom edge of the wall opening is 4 feet (1.2m) or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches (1.0

m) above the walking/working surface, shall be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest/restraint system.

(o) Walking/working surfaces not otherwise addressed. Except as provided in WAC 296-155-245(3) or in WAC 296-155-24503 (2)(a) through (n), each employee on a walking/working surface 4 feet (1.2m) or more above lower levels shall be protected from falling by a guardrail system, safety net system, or personal fall arrest/restraint system.

(3) Protection from falling objects. When an employee is exposed to falling objects, the employer shall have each employee wear a hard hat and shall implement one of the following measures:

(a) Erect toeboards, screens, or guardrail systems to prevent objects from falling from higher levels; or

(b) Erect a canopy structure and keep potential fall objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced; or

(c) Barricade the area to which objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced.

(4) Fall protection work plan.

(a) The employer shall develop and implement a written fall protection work plan including each area of the work place where the employees are assigned and where fall hazards of 10 feet or more exists.

(b) The fall protection work plan shall:

(i) Identify all fall hazards in the work area.

(ii) Describe the method of fall arrest or fall restraint to be provided.

(iii) Describe the correct procedures for the assembly, maintenance, inspection and disassembly of the fall protection system to be used.

(iv) Describe the correct procedures for the handling, storage, and securing of tools and materials.

(v) Describe the method of providing overhead protection for workers who may be in, or pass through the area below the work site.

(vi) Describe the method for prompt, safe removal of injured workers.

(vii) Be available on the job site for inspection by the department.

(c) Prior to permitting employees into areas where fall hazards exist the employer shall:

(i) Ensure that employees are trained and instructed in the items described in subdivision (b)(i) through (vi) of this subsection.

(ii) Inspect fall protection devices and systems to ensure compliance with WAC 296-155-24505.

(d) Training of employees as required by this subsection shall be documented and shall be available on the job site.

Note: When working between six and ten feet above the adjacent ground or floor, see WAC 296-155-24505(12).

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24503, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24503, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24505 Fall protection systems criteria and practices. (1) General.

(a) Fall protection systems required by Part C-1 shall comply with the applicable provisions of this section.

(b) Employers shall provide and install all fall protection systems required by Part C-1 for an employee, and shall comply with all other pertinent requirements of Part C-1 before that employee begins the work that necessitates the fall protection.

(2) Guardrail systems. Guardrail systems and their use shall comply with the following provisions:

(a) Top edge height of top rails, or equivalent guardrail system members, shall be 42 inches (1.1 m) plus or minus 3 inches (8 cm) above the walking/working level. When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of this subsection.

Note: When employees are using stilts, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the height of the stilts.

(b) Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall at least 21 inches (53 cm) high.

(i) Midrails, when used, shall be installed at a height midway between the top edge of the guardrail system and the walking/working level.

(ii) Screens and mesh, when used, shall extend from the top rail to the walking/working level and along the entire opening between top rail supports.

(iii) Intermediate members (such as balusters), when used between posts, shall be not more than 19 inches (48 cm) apart.

(iv) Other structural members (such as additional midrails and architectural panels) shall be installed such that there are no openings in the guardrail system that are more than 19 inches (.5 m) wide.

(c) Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied within 2 inches (5.1 cm) of the top edge, in any outward or downward direction, at any point along the top edge.

(d) When the 200 pound (890 N) test load specified in subdivision (c) of this subsection is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches (1.0m) above the walking/working level. Guardrail system components selected and constructed in accordance with the Appendix B to Part C-1 will be deemed to meet this requirement.

(e) Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding, without failure, a force of at least 150 pounds (666 N) applied in any downward or outward direction at any point along the midrail or other member.

(f) Guardrail systems shall be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

(g) The ends of all top rails and midrails shall not overhang the terminal posts, except where such overhang does not constitute a projection hazard.

(h) Steel banding and plastic banding shall not be used as top rails or midrails.

(i) Top rails and midrails shall be at least one-quarter inch (0.6 cm) nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails, it shall be flagged at not more than 6-foot intervals with high-visibility material.

(j) When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.

(k) When guardrail systems are used at holes, they shall be erected on all unprotected sides or edges of the hole.

(l) When guardrail systems are used around holes used for the passage of materials, the hole shall have not more than two sides provided with removable guardrail sections to allow the passage of materials. When the hole is not in use, it shall be closed over with a cover, or a guardrail system shall be provided along all unprotected sides or edges.

(m) When guardrail systems are used around holes which are used as points of access (such as ladderways), they shall be provided with a gate, or be so offset that a person cannot walk directly into the hole.

(n) Guardrail systems used on ramps and runways shall be erected along each unprotected side or edge.

(o) Manila, plastic or synthetic rope being used for top rails or midrails shall be inspected as frequently as necessary to ensure that it continues to meet the strength requirements of subdivision (c) of this subsection.

(3) Safety net systems. Safety net systems and their use shall comply with the following provisions:

(a) Safety nets shall be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet (9.1 m) below such level. When nets are used on bridges, the potential fall area from the walking/working surface to the net shall be unobstructed.

(b) Safety nets shall extend outward from the outermost projection of the work surface as follows:

<u>Vertical distance from working level to horizontal plane of net</u>	<u>Minimum required horizontal distance of outer edge of net from the edge of the working surface</u>
Up to 5 feet	8 feet
More than 5 feet up to 10 feet	10 feet
More than 10 feet	13 feet

(c) Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop test specified in subdivision (d) of this subsection.

(d) Safety nets and their installations shall be capable of absorbing an impact force equal to that produced by the drop test specified in subdivision (d) of this section.

(i) Except as provided in item (ii) of this subdivision, safety nets and safety net installations shall be drop-tested at the job site after initial installation and before being used as a fall protection system, whenever relocated, after major repair, and at 6-month intervals if left in one place. The drop-test shall consist of a 400 pound (180 kg) bag of sand 30 ± 2 inches (76 ± 5 cm) in diameter dropped into the net from the highest walking/working surface at which employees are exposed to fall hazards, but not from less than 42 inches (1.1 m) above that level.

(ii) When the employer can demonstrate that it is unreasonable to perform the drop-test required by item (i) of this subdivision, the employer (or a designated competent person) shall certify that the net and net installation is in compliance with the provisions of subsection (c) and item (i) of this subdivision by preparing a certification record prior to the net being used as a fall protection system. The certification record must include an identification of the net and net installation for which the certification record is being prepared; the date that it was determined that the identified net and net installation were in compliance with subdivision (c) of this subsection and the signature of the person making the determination and certification. The most recent certification record for each net and net installation shall be available at the job site for inspection.

(e) Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage, and other deterioration. Defective components shall be removed from service. Safety nets shall also be inspected after any occurrence which could affect the integrity of the safety net system.

(f) Materials, scrap pieces, equipment, and tools which have fallen into the safety net shall be removed as soon as possible from the net and at least before the next work shift.

(g) The maximum size of each safety net mesh opening shall not exceed 36 square inches (230 cm^2) nor be longer than 6 inches (15 cm) on any side, and the opening, measured center-to-center of mesh ropes or webbing, shall not be longer than 6 inches (15 cm). All mesh crossings shall be secured to prevent enlargement of the mesh opening.

(h) Each safety net (or section of it) shall have a border rope for webbing with a minimum breaking strength of 5,000 pounds (22.2 kN).

(i) Connections between safety net panels shall be as strong as integral net components and shall be spaced not more than 6 inches (15 cm) apart.

(4) Personal fall arrest systems. Personal fall arrest systems and their use shall comply with the provisions set forth below. Body belts may be used for a fall-restraining device.

Note: The use of a body belt in a positioning device system is acceptable and is regulated under subsection (5) of this section.

(a) Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.

(b) Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.

(c) Dee-rings and snap-hooks shall have a minimum tensile strength of 5,000 pounds (22.2 kN).

(d) Dee-rings and snap-hooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or taking permanent deformation.

(e) Snap-hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap-hook by depression of the snap-hook keeper by the connected member, or shall be a locking type snap-hook designed and used to prevent disengagement of the snap-hook by the contact of the snap-hook keeper by the connected member. Effective January 1, 1998, only locking type snap-hooks shall be used.

(f) Unless the snap-hook is a locking type and designed for the following connections, snap-hooks shall not be engaged:

(i) Directly to webbing, rope or wire rope;
(ii) To each other;
(iii) To a dee-ring to which another snap-hook or other connector is attached;

(iv) To a horizontal lifeline; or

(v) To any object which is incompatibly shaped or dimensioned in relation to the snap-hook such that unintentional disengagement could occur by the connected object being able to depress the snap-hook keeper and release itself.

(g) On suspended scaffolds or similar work platforms with horizontal lifelines which may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.

(h) Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest/fall-restraint system, which maintains a safety factor of at least two.

(i) Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds (22.2 kN).

(j) Except as provided in subdivision (k) of this subsection, when vertical lifelines are used, each employee shall be attached to a separate lifeline.

(k) During the construction of elevator shafts, two employees may be attached to the same lifeline in the hoistway, provided both employees are working atop a false car that is equipped with guardrails; the strength of the lifeline is 10,000 pounds (5,000 pounds per employee attached) (44.4 kN); and all other criteria specified in this subsection for lifelines have been met.

(l) Lifelines shall be protected against being cut or abraded.

(m) Self-retracting lifelines and lanyards which automatically limit free fall distance to 2 feet (0.61 m) or less shall be capable of sustaining a minimum tensile load of 3,000 pounds (13.3 kN) applied to the device with the lifeline or lanyard in the fully extended position.

(n) Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet (0.61 m) or less, ripstitch lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds (22.2 kN) applied to the device with the lifeline or lanyard in the fully extended position.

(o) Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses shall be made from synthetic fibers.

(p) Anchorage's used for attachment of personal fall arrest equipment shall be independent of any anchorage

being used to support or suspend platforms and capable of supporting at least 5,000 pounds (22.2 kN) per employee attached, or shall be designed, installed, and used as follows:

(i) As part of a complete personal fall arrest system which maintains a safety factor of at least two; and

(ii) Under the supervision of a qualified person.

(q) Personal fall arrest systems, when stopping a fall, shall:

(i) Limit maximum arresting force on an employee to 1,800 pounds (8 kN) when used with a body harness;

(ii) Be rigged such that an employee can neither free fall more than 6 feet (1.8 m), nor contact any lower level;

(iii) Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 m); and,

(iv) Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8 m), or the free fall distance permitted by the system, whichever is less.

Note: If the personal fall arrest system meets the criteria and protocols contained in Appendix C to Part C-1, and if the system is being used by an employee having a combined person and tool weight of less than 310 pounds (140 kg), the system will be considered to be in compliance with the provisions of this subdivision. If the system is used by an employee having a combined tool and body weight of 310 pounds (140 kg) or more, then the employer must appropriately modify the criteria and protocols of the Appendix to provide proper protection for such heavier weights, or the system will not be deemed to be in compliance with the requirements of this subdivision.

(r) The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head.

(s) Harnesses and components shall be used only for employee protection (as part of a personal fall arrest/fall-restraint system or positioning device system) and not to hoist materials.

(t) Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.

(u) The employer shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves.

(v) Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service.

(w) Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists except as specified in other parts of chapter 296-155 WAC.

(x) When a personal fall arrest system is used at hoist areas, it shall be rigged to allow the movement of the employee only as far as the edge of the walking/working surface.

(5) Personal fall restraint.

(a) Body belts or harnesses may be used for personal fall restraint.

(b) Body belts shall be at least one and five-eighths (1 5/8) inches (4.1 cm) wide.

(c) Anchorage points used for fall restraint shall be capable of supporting 4 times the intended load.

(d) Restraint protection shall be rigged to allow the movement of employees only as far as the sides of the walking/working surface.

(6) Positioning device systems. Positioning device systems and their use shall conform to the following provisions:

(a) Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet (.61 m).

(b) Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kN), whichever is greater.

(c) Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.

(d) Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of this system.

(e) Connecting assemblies shall have a minimum tensile strength of 5,000 pounds (22.2 kN)

(f) Dee-rings and snap-hooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or taking permanent deformation.

(g) Snap-hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap-hook by depression of the snap-hook keeper by the connected member, or shall be a locking type snap-hook designed and used to prevent disengagement of the snap-hook by the contact of the snap-hook keeper by the connected member. As of January 1, 1998, only locking type snap-hooks shall be used.

(h) Unless the snap-hook is a locking type and designed for the following connections, snap-hooks shall not be engaged:

(i) Directly to webbing, rope or wire rope;

(ii) To each other;

(iii) To a dee-ring to which another snap-hook or other connector is attached;

(iv) To a horizontal lifeline; or

(v) To any object which is incompatibly shaped or dimensioned in relation to the snap-hook such that unintentional disengagement could occur by the connected object being able to depress the snap-hook keeper and release itself.

(i) Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration, and defective components shall be removed from service.

(j) Body belts, harnesses, and components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.

(7) Warning line systems. Warning line systems (see WAC 296-155-24503 (2)(j)) and their use shall comply with the following provisions:

(a) The warning line shall be erected around all sides of the roof work area or leading edge(s).

(i) When mechanical equipment is not being used, the warning line shall be erected not less than 6 feet (1.8 m) from the roof edge.

(ii) When mechanical equipment is being used, the warning line shall be erected not less than 6 feet (1.8 m) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet

(3.1 m) from the roof edge which is perpendicular to the direction of mechanical equipment operation.

(iii) Points of access, materials handling areas, storage areas, and hoisting areas shall be connected to the work area by an access path formed by two warning lines.

(iv) When the path to a point of access is not in use, a rope, wire, chain, or other barricade, equivalent in strength and height to the warning line, shall be placed across the path at the point where the path intersects the warning line erected around the work area, or the path shall be offset such that a person cannot walk directly into the work area.

(b) Warning lines shall consist of ropes, wires, or chains, and supporting stanchions erected as follows:

(i) The rope, wire, or chain shall be flagged at not more than 6-foot (1.8m) intervals with high-visibility material;

(ii) The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 39 inches (1.0m) from the walking/working surface and its highest point is no more than 45 inches (1.3 m) from the walking/working surface.

(iii) After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion, 30 inches (.8 m) above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge;

(iv) The rope, wire, or chain shall have a minimum tensile strength of 500 pounds (2.22 kN), and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions as prescribed in item (iii) of this subdivision; and

(v) The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

(c) No employee shall be allowed in the area between a roof edge/leading edge and a warning line unless the employee is performing roofing work in that area.

(d) Mechanical equipment on roofs/leading edges shall be used or stored only in areas where employees are protected by a warning line system, guardrail system, or personal fall arrest system.

(e) Warning line and safety monitor systems are prohibited on any surface whose dimensions are less than 45 inches in all directions.

(f) Roof edge materials handling areas and materials storage. Employees working in a roof edge materials handling or materials storage area location on a low-pitched roof with a ground to eave height greater than 6 feet shall be protected from falling along all unprotected roof sides and edges of the area.

(i) When guardrails are used at hoisting areas, a minimum of four feet of guardrail shall be erected on each side of the access point through which materials are hoisted.

(ii) A chain or gate shall be placed across the opening between the guardrail sections when hoisting operations are not taking place.

(iii) When guardrails are used at bitumen pipe outlets, a minimum of four feet of guardrail shall be erected on each side of the pipe.

(iv) When safety belt/harness systems are used, they shall not be attached to the hoist.

(v) When fall-restraint systems are used, they shall be rigged to allow the movement of employees only as far as the roof edge.

(vi) Materials shall not be stored within six feet of the roof edge unless guardrails are erected at the roof edge.

(8) Controlled access zones. Controlled access zones (see WAC 296-155-24503 (2)(i) and subsection (12) of this section) and their use shall conform to the following provisions:

(a) When positive means of fall restraint, or fall arrest are not utilized, a safety monitor system shall be implemented to protect employees working between the forward edge of the control/warning line and the leading edge.

(b) When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.

(i) When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge, except when erecting precast concrete members.

(ii) When erecting precast concrete members, the control line shall be erected not less than 6 feet (1.8 m) nor more than 60 feet (18 m) or half the length of the member being erected, whichever is less, from the leading edge.

(iii) The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

(iv) The control line shall be connected on each side to a guardrail system or wall.

(c) When used to control access to areas where overhand bricklaying and related work are taking place:

(i) The controlled access zone shall be defined by a control line erected not less than 10 feet (3.1 m) nor more than 15 feet (4.5 m) from the working edge.

(ii) The control line shall extend for a distance sufficient for the controlled access zone to enclose all employees performing overhand bricklaying and related work at the working edge and shall be approximately parallel to the working edge.

(iii) Additional control lines shall be erected at each end to enclose the controlled access zone.

(iv) Only employees engaged in overhand bricklaying or related work shall be permitted in the controlled access zone.

(d) Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:

(i) Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.

(ii) Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m) (50 inches (1.3 m) when overhand bricklaying operations are being performed) from the walking/working surface.

(iii) Each line shall have a minimum breaking strength of 200 pounds (.88 kN).

(e) On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying

operations, controlled access zones shall be enlarged, as necessary, to enclose all points of access, material handling areas, and storage areas.

(f) On floors and roofs where guardrail systems are in place, but need to be removed to allow overhand bricklaying work or leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed.

(9) Safety monitoring systems. Safety monitoring systems (see WAC 296-155-24503 (2)(j) and subsection (12) of this section) and their use shall comply with the following provisions:

(a) The employer shall designate a competent person as defined in WAC 296-155-24501 to monitor the safety of other employees and the employer shall ensure that the safety monitor complies with the following requirements:

(i) The safety monitor shall be competent to recognize fall hazards;

(ii) The safety monitor shall warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner;

(iii) The safety monitor shall be on the same walking/working surface and within visual sighting distance of the employee(s) being monitored;

(iv) The safety monitor shall be close enough to communicate orally with the employee;

(v) The safety monitor shall not have other responsibilities which could take the monitor's attention from the monitoring function;

(vi) Be instantly distinguishable over members of the work crew;

(vii) Not supervise more than eight exposed workers at one time; and

(viii) The safety monitor system shall not be used when adverse weather conditions create additional hazards.

(b) Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-slope roofs.

(c) No employee, other than an employee engaged in roofing/leading edge work (on low-sloped roofs) or an employee covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.

(d) Each employee working in a controlled access zone shall be directed to comply promptly with fall hazard warnings from safety monitors.

(e) Controlled (access) zone workers shall be distinguished from other members of the crew by wearing a high-visibility vest only while in the control zone.

(10) Covers. Covers for holes in floors, roofs, and other walking/working surfaces shall meet the following requirements:

(a) Covers located in roadways and vehicular aisles shall be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle exposed to cross over the cover.

(b) All other covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.

(c) All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.

(d) All covers shall be color coded or they shall be marked with the word "hole" or "cover" to provide warning of the hazard.

Note: This provision does not apply to cast iron manhole covers or steel grates used on streets or roadways.

(11) Protection from falling objects. Falling object protection shall comply with the following provisions:

(a) Toeboards, when used as falling object protection, shall be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.

(b) Toeboards shall be capable of withstanding, without failure, a force of at least 50 pounds (222 N) applied in any downward or outward direction at any point along the toeboard.

(c) Toeboards shall be a minimum of 3 1/2 inches (9 cm) in vertical height from their top edge to the level of the walking/working surface. They shall have not more than 1/4 inch (0.6 cm) clearance above the walking/working surface. They shall be solid or have openings not over 1 inch (2.5 cm) in greatest dimension.

(d) Where tools, equipment, or materials are piled higher than the top edge of a toeboard, paneling or screening shall be erected from the walking/working surface or toeboard to the top of a guardrail system's top rail or midrail, for a distance sufficient to protect employees below.

(e) Guardrail systems, when used as falling object protection, shall have all openings small enough to prevent passage of potential falling objects.

(f) During the performance of overhand bricklaying and related work:

(i) No materials or equipment except masonry and mortar shall be stored within 4 feet (1.2m) of the working edge.

(ii) Excess mortar, broken or scattered masonry units, and all other materials and debris shall be kept clear from the work area by removal at regular intervals.

(g) During the performance of roofing work:

(i) Materials and equipment shall not be stored within 6 feet (1.8m) of a roof edge unless guardrails are erected at the edge.

(ii) Materials which are piled, grouped, or stacked near a roof edge shall be stable and self-supporting.

(h) Canopies, when used as falling object protection, shall be strong enough to prevent collapse and to prevent penetration by any objects which may fall onto the canopy.

(12) Fall protection plan. This option is available only to employers engaged in leading edge work, precast concrete erection work, or residential construction work (see WAC 296-155-24503 (2)(b), (l), and (m)) when the work being done is greater than six (6) (1.8m) feet but does not exceed ten (10) feet (3.05m) above the adjacent ground level or floor and can demonstrate that it is infeasible or it creates a greater hazard to use conventional fall protection equipment. The fall protection plan must conform to the following provisions.

Note: See WAC 296-155-24503(4) when working ten feet or more above the adjacent floor or ground level.

(a) The fall protection plan shall be prepared by a qualified person and developed specifically for the site where the leading edge work, precast concrete work, or residential construction work is being performed and the plan must be maintained up to date.

(b) Any changes to the fall protection plan shall be approved by a qualified person.

(c) A copy of the fall protection plan with all approved changes shall be maintained at the job site.

(d) The implementation of the fall protection plan shall be under the supervision of a competent person.

(e) The fall protection plan shall document the reasons why the use of conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety net systems) are infeasible or why their use would create a greater hazard.

(f) The fall protection plan shall include a written discussion of other measures that will be taken to reduce or eliminate the fall hazard for workers who cannot be provided with protection from the conventional fall protection systems. For example, the employer shall discuss the extent to which scaffolds, ladders, or vehicle mounted work platforms can be used to provide a safer working surface and thereby reduce the hazard of falling.

(g) The fall protection plan shall identify each location where conventional fall protection methods cannot be used. These locations shall then be classified as controlled access zones and the employer must comply with the criteria in subsection (7) of this section.

(h) Where no other alternative measure has been implemented, the employer shall implement a safety monitoring system in conformance with subsection (8) of this section.

(i) The fall protection plan must include a statement which provides the name or other method of identification for each employee who is designated to work in controlled access zones. No other employees may enter controlled access zones.

(j) In the event an employee falls, or some other related, serious incident occurs, (e.g., a near miss) the employer shall investigate the circumstances of the fall or other incident to determine if the fall protection plan needs to be changed (e.g., new practices, procedures, or training) and shall implement those changes to prevent similar types of falls or incidents.

Note: See WAC 296-155-24523, Appendix E to this Part for guidance in completing a fall protection plan to comply with this subsection.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24505, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24505, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24507 Training requirements. The following training provisions supplement other training requirements contained in chapter 296-155 WAC. Training shall be conducted regarding the hazards addressed in this part.

(1) Training program.

(a) The employer shall provide a training program for each employee who might be exposed to fall hazards. The

program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.

(b) The employer shall assure that each employee has been trained, as necessary, by a competent person qualified in the following areas:

(i) The nature of fall hazards in the work area;

(ii) The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;

(iii) The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used;

(iv) The role of each employee in the safety monitoring system when this system is used;

(v) The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs;

(vi) The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection;

(vii) The role of employees in fall protection plans; and

(viii) The standards contained in this part.

(2) Certification of training.

(a) The employer shall verify compliance with subsection (1) of this section by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted by another employer or completed prior to the effective date of this part, the certification record shall indicate the date the employer determined the prior training was adequate rather than the date of actual training.

(b) The latest training certification shall be maintained.

(3) Retraining. When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by subsection (1) of this section, the employer shall retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:

(a) Changes in the workplace render previous training obsolete; or

(b) Changes in the types of fall protection systems or equipment to be used render previous training obsolete; or

(c) Inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24507, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24510 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24510, filed 4/25/95, effective 10/1/95; 95-04-007, § 296-155-24510, filed 1/18/95, effective 3/1/95; 93-19-142 (Order 93-04), § 296-155-24510, filed 9/22/93, effective 11/1/93; 91-24-017 (Order 91-07), § 296-155-24510, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-24510, filed 1/10/91, effective 2/12/91.]

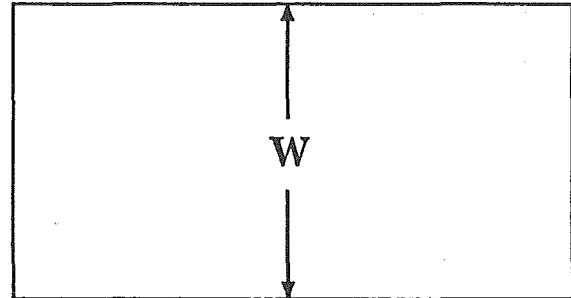
WAC 296-155-24515 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24515, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-24515, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-24515, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24519 Appendix A to Part C-1—Determining roof widths nonmandatory guidelines for complying with WAC 296-155-24503 (2)(j). (1) This appendix serves as a guideline to assist employers complying with the requirements of WAC 296-155-24503 (2)(j). WAC 296-24503 (2)(j) allows the use of a safety monitoring system alone as a means of providing fall protection during the performance of roofing operations on low-sloped roofs 50 feet (15.25 m) or less in width. Each example in the appendix shows a roof plan or plans and indicates where each roof or roof area is to be measured to determine its width. Section views or elevation views are shown where appropriate. Some examples show "correct" and "incorrect" subdivisions of irregularly shaped roofs divided into smaller, regularly shaped areas. In all examples, the dimension selected to be the width of an area is the lesser of the two primary dimensions of the area, as viewed from above. Example A shows that on a simple rectangular roof, width is the lesser of the two primary overall dimensions. This is also the case with roofs which are sloped toward or away from the roof center, as shown in Example B.

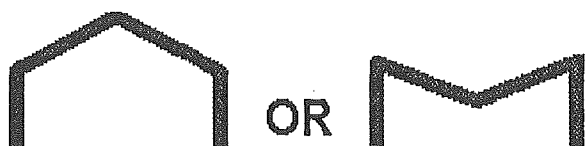
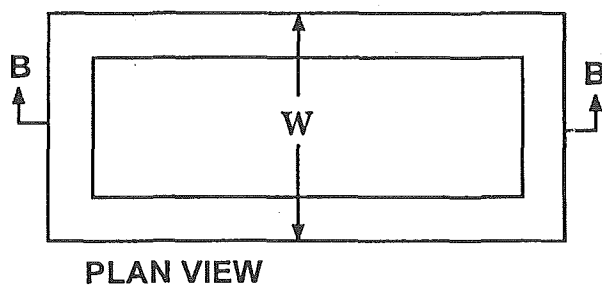
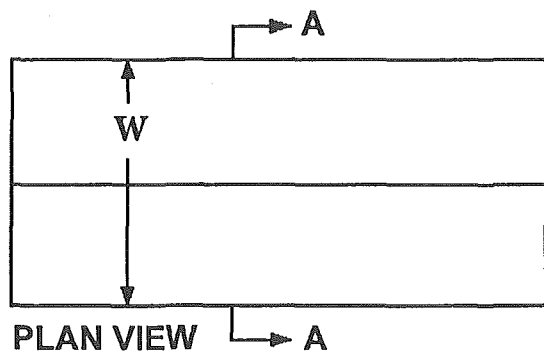
(2) Many roofs are not simple rectangles. Such roofs may be broken down into subareas as shown in Example C. The process of dividing a roof area can produce many different configurations. Example C gives the general rule of using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than 50 feet (15.25 m) wide. The intent is to minimize the number of roof areas where safety monitoring systems alone are sufficient protection.

(3) Roofs which are comprised of several separate, non-contiguous roof areas, as in Example D, may be considered as a series of individual roofs. Some roofs have penthouses, additional floors, courtyard openings, or similar architectural features; Example E shows how the rule for dividing roofs into subareas is applied to such configurations. Irregular, nonrectangular roofs must be considered on an individual basis, as shown in Example F.

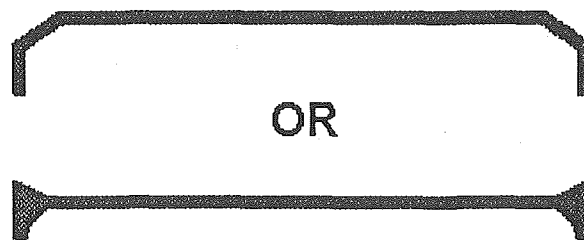
Example A***Rectangular Shaped Roof*****PLAN VIEW**

Example B

Sloped Rectangular Shaped Roofs

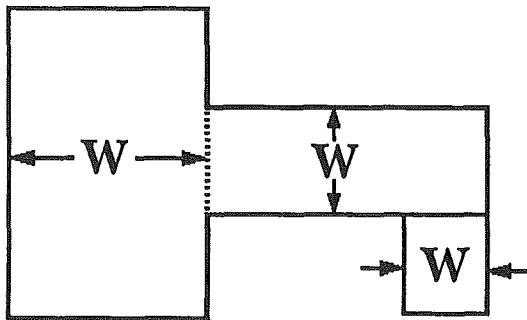
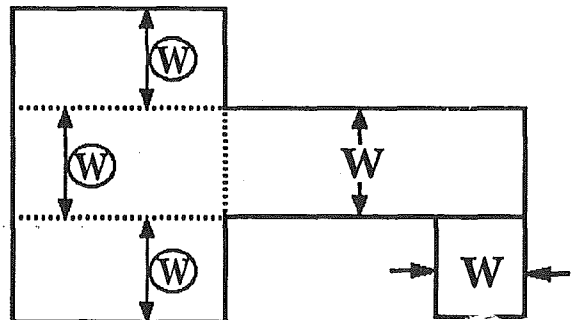
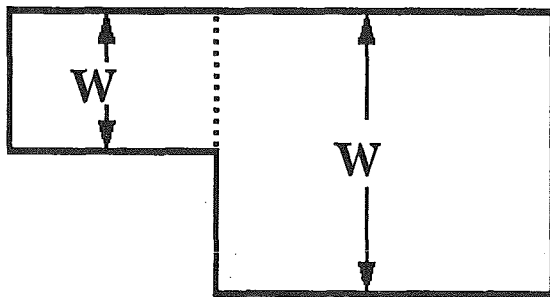
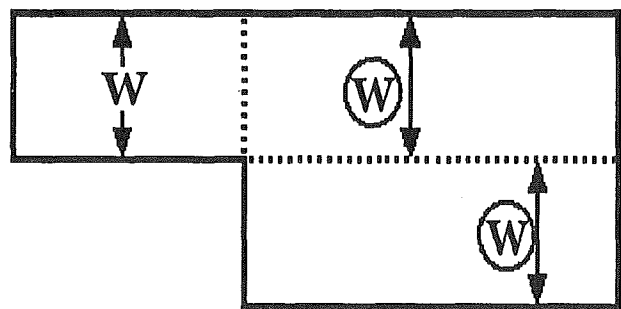
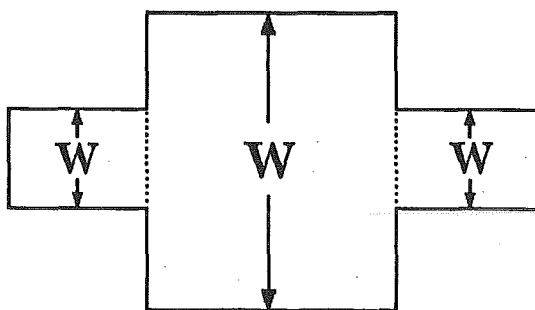
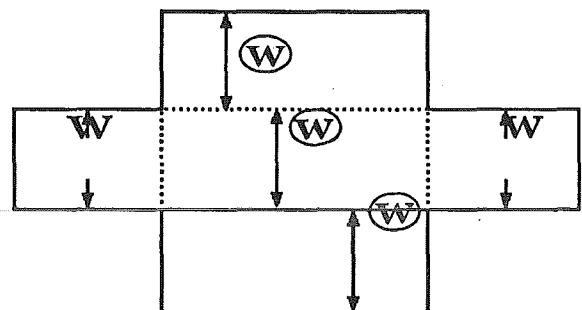


SECTION A-A



SECTION B-B

Example C

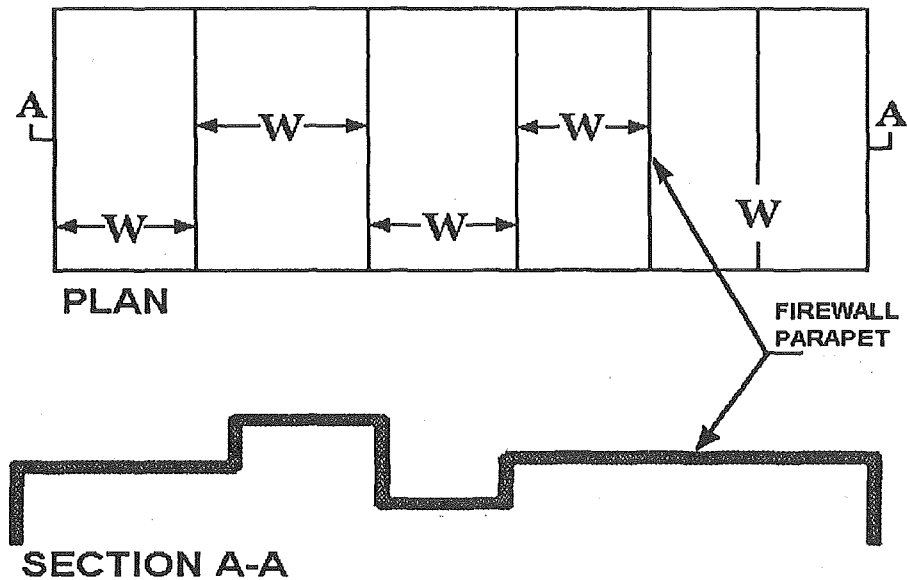
Irregularly Shaped Roofs With Rectangular Shaped Sections**Correct****Incorrect****Correct****Incorrect****Correct****Incorrect**

Such roofs are to be divided into subareas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to 50 feet (15.25 meters) in width, in order to limit the size of roof areas where the safety monitoring system alone can be used (WAC 296-155-24505 (2)(j)). Dotted lines are used in the examples to show the location of dividing lines. W denotes incorrect measurements of width.

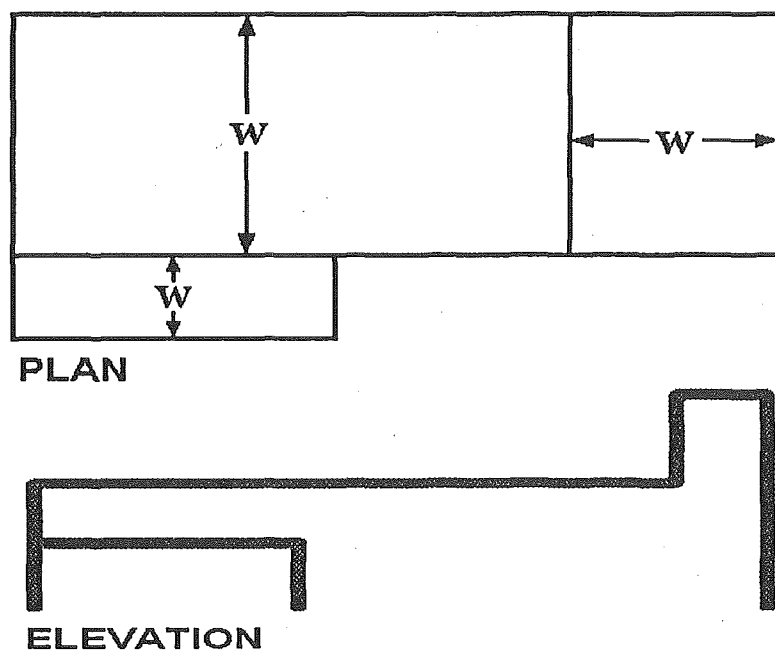
Example D

Separate, Non-Contiguous Roof Areas

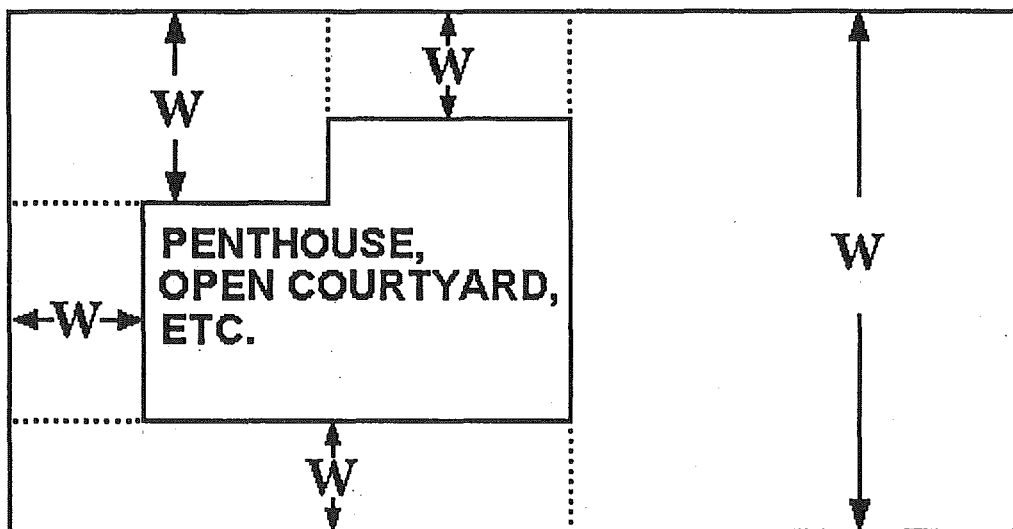
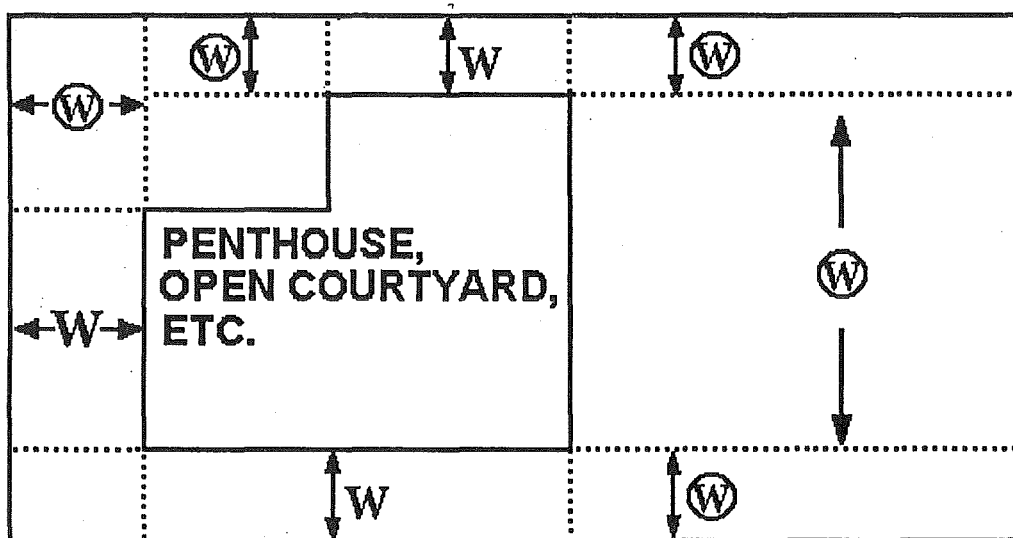
1.



2.



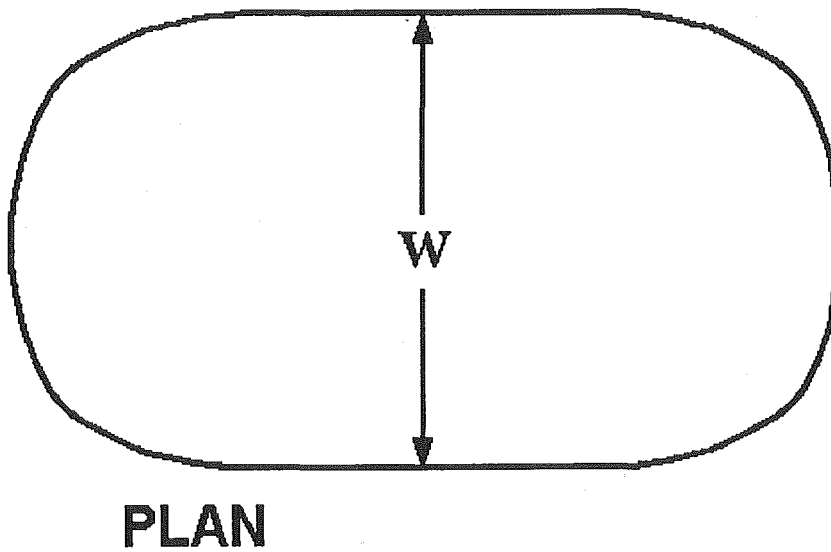
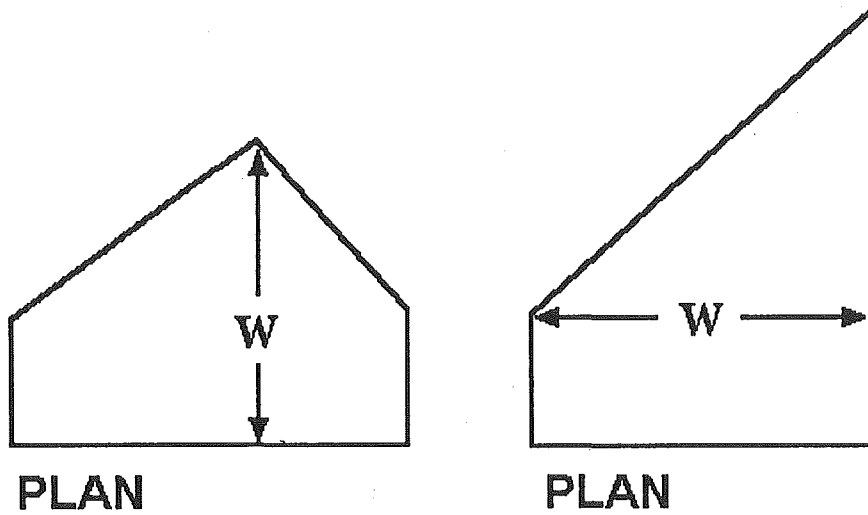
Example E

Roofs With Penthouses, Open Courtyards, Additional Floors, etc.**CORRECT****INCORRECT**

Such roofs are to be divided into subareas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to 50 feet (15.25 meters) in width, in order to limit the size of roof areas where the safety monitoring system alone can be used (WAC 296-155-24505 (2)(j)). Dotted lines are used in the examples to show the location of dividing lines. W denotes incorrect measurements of width.

Example F

Irregular, Non-Rectangular Shaped Roofs



WAC 296-155-24520 Appendix B to Part C-1—Guardrail systems nonmandatory guidelines for complying with WAC 296-155-24505(2). The standard requires guardrail systems and components to be designed and built to meet the requirements of WAC 296-155-24505 (2)(c), (d) and (e). This Appendix serves as a nonmandatory guideline to assist employers in complying with these requirements. An employer may use these guidelines as a starting point for designing guardrail systems. However, the guidelines do not provide all the information necessary to build a complete system, and the employer is still responsible for designing and assembling these components in such a way that the completed system will meet the requirements of WAC 296-155-24505 (2)(c), (d) and (e). Components for which no specific guidelines are given in this Appendix (e.g., joints, base connections, components made with other materials, and components with other dimensions) must also be designed and constructed in such a way that the completed system meets the requirements of WAC 296-155-24505.

(1) For wood railings: Wood components shall be a minimum of 1500 lb-ft/in² fiber (stress grade) construction grade lumber; the posts shall be at least 2-inch by 4-inch (5 cm x 10 cm) lumber spaced not more than 8 feet (2.4 m) apart on centers; the top rail shall be at least 2-inch by 4-inch (5 cm x 10 cm) lumber, the intermediate rail shall be at least 1-inch by 6-inch (2.5 cm x 15 cm) lumber. All lumber dimensions are nominal sizes as provided by the American Softwood Lumber Standards, dated January 1970.

(2) For pipe railings: Posts, top rails, and intermediate railings shall be at least one and one-half inches nominal diameter (schedule 40 pipe) with posts spaced not more than 8 feet (2.4 m) apart on centers.

(3) For structural steel railings: Posts, top rails, and intermediate rails shall be at least 2-inch by 2-inch (5 cm x 10 cm) by 3/8-inch (1.1 cm) angles, with posts spaced not more than 8 feet (2.4 m) apart on centers.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24520, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-24520, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-24520, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24521 Appendix C to Part C-1—Personal fall arrest systems nonmandatory guidelines for complying with WAC 296-155-24505(4). (1) Test methods for personal fall arrest systems and positioning device systems.

(a) General. This Appendix serves as a nonmandatory guideline to assist employers comply with the requirements in WAC 296-155-24505(4). Subdivisions (b), (c), (d) and (e) of this Appendix describe test procedures which may be used to determine compliance with the requirements in WAC 296-155-24505 (4)(q). As noted in Appendix D of this part, the test methods listed here in Appendix C can also be used to assist employers to comply with the requirements in WAC 296-155-24505 (6)(c) and (d) for positioning device systems.

(b) General conditions for all tests in the Appendix to WAC 296-155-24505(4).

(i) Lifelines, lanyards and deceleration devices should be attached to an anchorage and connected to the body harness in the same manner as they would be when used to protect employees.

(ii) The anchorage should be rigid, and should not have a deflection greater than 0.04 inches (1 mm) when a force of 2,250 pounds (10 kN) is applied.

(iii) The frequency response of the load measuring instrumentation should be 500 Hz.

(iv) The test weight used in the strength and force tests should be a rigid, metal, cylindrical or torso-shaped object with a girth of 38 inches plus or minus 4 inches (96 cm plus or minus 10 cm).

(v) The lanyard or lifeline used to create the free fall distance should be supplied with the system, or in its absence, the least elastic lanyard or lifeline available to be used with the system.

(vi) The test weight for each test should be hoisted to the required level and should be quickly released without having any appreciable motion imparted to it.

(vii) The system's performance should be evaluated taking into account the range of environmental conditions for which it is designed to be used.

(viii) Following the test, the system need not be capable of further operation.

(c) Strength test.

(i) During the testing of all systems, a test weight of 300 pounds plus or minus 5 pounds (135 kg plus or minus 2.5 kg) should be used. (See subdivision (b)(iv) of this subsection).

(ii) The test consists of dropping the test weight once. A new unused system should be used for each test.

(iii) For lanyard systems, the lanyard length should be 6 feet plus or minus 2 inches (1.83 m plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the (body belt or) body harness.

(iv) For rope-grab-type deceleration systems, the length of the lifeline above the centerline of the grabbing mechanism to the lifeline's anchorage point should not exceed 2 feet (0.61 m).

(v) For lanyard systems, for systems with deceleration devices which do not automatically limit free fall distance to 2 feet (0.61 m) or less, and for systems with deceleration devices which have a connection distance in excess of 1 foot (0.3 m) (measured between the centerline of the lifeline and the attachment point to the harness), the test weight should be rigged to free fall a distance of 7.5 feet (2.3 m) from a point that is 1.5 feet (.46 m) above the anchorage point, to its hanging location (6 feet below the anchorage). The test weight should fall without interference, obstruction, or hitting the floor or ground during the test. In some cases a non-elastic wire lanyard of sufficient length may need to be added to the system (for test purposes) to create the necessary free fall distance.

(vi) For deceleration device systems with integral lifelines or lanyards which automatically limit free fall distance to 2 feet (0.61 m) or less, the test weight should be rigged to free fall a distance of 4 feet (1.22 m).

(vii) Any weight which detaches from the harness has failed the strength test.

(d) Force test.

(i) General. The test consists of dropping the respective test weight once as specified in (d)(ii)(A) or (d)(iii)(A) of this subsection. A new, unused system should be used for each test.

(ii) For lanyard systems.

(A) A test weight of 220 pounds plus or minus 3 pounds (100 kg plus or minus 1.6 kg) should be used. (See (b)(iv) of this subsection.)

(B) Lanyard length should be 6 feet plus or minus two inches (1.83 m plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the body harness.

(C) The test weight should fall free from the anchorage level to its hanging location (a total of 6 feet (1.83 m) free fall distance) without interference, obstruction, or hitting the floor or ground during the test.

(iii) For all other systems.

(A) A test weight of 220 pounds plus or minus 3 pounds (100 kg plus or minus 1.6 kg) should be used. (See (b)(iv) of this subsection.)

(B) The free fall distance to be used in the test should be the maximum fall distance physically permitted by the system during normal use conditions, up to a maximum free fall distance for the test weight of 6 feet (1.83 m), except as follows:

(I) For deceleration systems which have a connection link or lanyard, the test weight should free fall a distance equal to the connection distance (measured between the centerline of the lifeline and the attachment point to the harness).

(II) For deceleration device systems with integral lifelines or lanyards which automatically limit free fall distance to 2 feet (0.61 m) or less, the test weight should free fall a distance equal to that permitted by the system in normal use. (For example, to test a system with a self-retracting lifeline or lanyard, the test weight should be supported and the system allowed to retract the lifeline or lanyard as it would in normal use. The test weight would then be released and the force and deceleration distance measured.)

(iv) A system fails the force test if the recorded maximum arresting force exceeds 2,520 pounds (11.2 kN) when using a body harness.

(v) The maximum elongation and deceleration distance should be recorded during the force test.

(e) Deceleration device tests.

(i) General. The device should be evaluated or tested under the environmental conditions, (such as rain, ice, grease, dirt, type of lifeline, etc.), for which the device is designed.

(ii) Rope-grab-type deceleration devices.

(A) Devices should be moved on a lifeline 1,000 times over the same length of line a distance of not less than 1 foot (30.5 cm), and the mechanism should lock each time.

(B) Unless the device is permanently marked to indicate the type(s) of lifeline which must be used, several types (different diameters and different materials), of lifelines should be used to test the device.

(iii) Other self-activating-type deceleration devices. The locking mechanisms of other self-activating-type deceleration devices designed for more than one arrest should lock each of 1,000 times as they would in normal service.

(2) Additional non-mandatory guidelines for personal fall arrest systems. The following information constitutes additional guidelines for use in complying with requirements for a personal fall arrest system.

(a) Selection and use considerations.

(i) The kind of personal fall arrest system selected should match the particular work situation, and any possible free fall distance should be kept to a minimum. Consideration should be given to the particular work environment. For example, the presence of acids, dirt, moisture, oil, grease, etc., and their effect on the system, should be evaluated. Hot or cold environments may also have an adverse effect on the system. Wire rope should not be used where an electrical hazard is anticipated. As required by the standard, the employer must plan to have means available to promptly rescue an employee should a fall occur, since the suspended employee may not be able to reach a work level independently.

(ii) Where lanyards, connectors, and lifelines are subject to damage by work operations such as welding, chemical cleaning, and sandblasting, the component should be protected, or other securing systems should be used. The employer should fully evaluate the work conditions and environment (including seasonal weather changes) before selecting the appropriate personal fall protection system. Once in use, the system's effectiveness should be monitored. In some cases, a program for cleaning and maintenance of the system may be necessary.

(b) Testing considerations. Before purchasing or putting into use a personal fall arrest system, an employer should obtain from the supplier information about the system based on its performance during testing so that the employer can know if the system meets this standard. Testing should be done using recognized test methods. This Appendix contains test methods recognized for evaluating the performance of fall arrest systems. Not all systems may need to be individually tested; the performance of some systems may be based on data and calculations derived from testing of similar systems, provided that enough information is available to demonstrate similarity of function and design.

(c) Component compatibility considerations. Ideally, a personal fall arrest system is designed, tested, and supplied as a complete system. However, it is common practice for lanyards, connectors, lifelines, deceleration devices, and body harnesses to be interchanged since some components wear out before others. The employer and employee should realize that not all components are interchangeable. For instance, a lanyard should not be connected between a harness and a deceleration device of the self-retracting type since this can result in additional free fall for which the system was not designed. Any substitution or change to a personal fall arrest system should be fully evaluated or tested by a competent person to determine that it meets the standard, before the modified system is put in use.

(d) Employee training considerations. Thorough employee training in the election and use of personal fall arrest systems is imperative. Employees must be trained in the safe use of the system. This should include the following: Application limits; proper anchoring and tie-off techniques; estimation of free fall distance, including determination of deceleration distance, and total fall distance to prevent striking a lower level; methods of use; and inspection and storage of the system. Careless or improper use of the equipment can result in serious injury or death. Employers and employees should become familiar with the material in this Appendix, as well as manufacturer's recom-

mendations, before a system is used. Of uppermost importance is the reduction in strength caused by certain tie-offs (such as using knots, tying around sharp edges, etc.) and maximum permitted free fall distance. Also, to be stressed are the importance of inspections prior to use, the limitations of the equipment, and unique conditions at the worksite which may be important in determining the type of system to use.

(e) Instruction considerations. Employers should obtain comprehensive instructions from the supplier as to the system's proper use and application, including, where applicable:

- (i) The force measured during the sample force test;
- (ii) The maximum elongation measured for lanyards during the force test;
- (iii) The deceleration distance measured for deceleration devices during the force test;
- (iv) Caution statements on critical use limitations;
- (v) Application limits;
- (vi) Proper hook-up, anchoring and tie-off techniques, including the proper dee-ring or other attachment point to use on the harness for fall arrest;
- (vii) Proper climbing techniques;
- (viii) Methods of inspection, use, cleaning, and storage;

and

- (ix) Specific lifelines which may be used. This information should be provided to employees during training.

(f) Rescue considerations. As required by WAC 296-155-24505 (4)(u), when personal fall arrest systems are used, the employer must assure that employees can be promptly rescued or can rescue themselves should a fall occur. The availability of rescue personnel, ladders or other rescue equipment should be evaluated. In some situations, equipment which allows employees to rescue themselves after the fall has been arrested may be desirable, such as devices which have descent capability.

(g) Inspection considerations. As required by WAC 296-155-24505 (4)(v), personal fall arrest systems must be regularly inspected. Any component with any significant defect, such as cuts, tears, abrasions, mold, or undue stretching; alterations or additions which might affect its efficiency; damage due to deterioration; contact with fire, acids, or other corrosives; distorted hooks or faulty hook springs; tongues unfitted to the shoulder of buckles; loose or damaged mountings; non-functioning parts; or wearing or internal deterioration in the ropes must be withdrawn from service immediately, and should be tagged or marked as unusable, or destroyed.

(h) Tie-off considerations.

(i) One of the most important aspects of personal fall protection systems is fully planning the system before it is put into use. Probably the most overlooked component is planning for suitable anchorage points. Such planning should ideally be done before the structure or building is constructed so that anchorage points can be incorporated during construction for use later for window cleaning or other building maintenance. If properly planned, these anchorage points may be used during construction, as well as afterwards.

(A) Properly planned anchorages should be used if they are available. In some cases, anchorages must be installed immediately prior to use. In such cases, a registered

professional engineer with experience in designing fall protection systems, or another qualified person with appropriate education and experience should design an anchor point to be installed.

(B) In other cases, the department recognizes that there will be a need to devise an anchor point from existing structures. Examples of what might be appropriate anchor points are steel members or I-beams if an acceptable strap is available for the connection (do not use a lanyard with a snap-hook clipped onto itself); large eye-bolts made of an appropriate grade steel; guardrails or railings if they have been designed for use as an anchor point; or masonry or wood members only if the attachment point is substantial and precautions have been taken to assure that bolts or other connectors will not pull through. A qualified person should be used to evaluate the suitability of these "make shift" anchorages with a focus on proper strength.

(ii) Employers and employees should at all times be aware that the strength of a personal fall arrest system is based on its being attached to an anchoring system which does not reduce the strength of the system (such as a properly dimensioned eye-bolt/snap-hook anchorage). Therefore, if a means of attachment is used that will reduce the strength of the system, that component should be replaced by a stronger one, but one that will also maintain the appropriate maximum arrest force characteristics.

(iii) Tie-off using a knot in a rope lanyard or lifeline (at any location) can reduce the lifeline or lanyard strength by 50 percent or more. Therefore, a stronger lanyard or lifeline should be used to compensate for the weakening effect of the knot, or the lanyard length should be reduced (or the tie-off location raised) to minimize free fall distance, or the lanyard or lifeline should be replaced by one which has an appropriately incorporated connector to eliminate the need for a knot.

(iv) Tie-off of a rope lanyard or lifeline around an "H" or "I" beam or similar support can reduce its strength as much as 70 percent due to the cutting action of the beam edges. Therefore, use should be made of a webbing lanyard or wire core lifeline around the beam; or the lanyard or lifeline should be protected from the edge; or free fall distance should be greatly minimized.

(v) Tie-off where the line passes over or around rough or sharp surfaces reduces strength drastically. Such a tie-off should be avoided or an alternative tie-off rigging should be used. Such alternatives may include use of a snap-hook/dee-ring connection, wire rope tie-off, an effective padding of the surfaces, or an abrasion-resistance strap around or over the problem surface.

(vi) Horizontal lifelines may, depending on their geometry and angle of sag, be subjected to greater loads than the impact load imposed by an attached component. When the angle of horizontal lifeline sag is less than 30 degrees, the impact force imparted to the lifeline by an attached lanyard is greatly amplified. For example, with a sag angle of 15 degrees, the force amplification is about 2:1 and at 5 degrees sag, it is about 6:1. Depending on the angle of sag, and the line's elasticity, the strength of the horizontal lifeline and the anchorages to which it is attached should be increased a number of times over that of the lanyard. Extreme care should be taken in considering a horizontal lifeline for multiple tie-offs. The reason for this is that in multiple tie-

offs to a horizontal lifeline, if one employee falls, the movement of the falling employee and the horizontal lifeline during arrest of the fall may cause other employees to fall also. Horizontal lifeline and anchorage strength should be increased for each additional employee to be tied off. For these and other reasons, the design of systems using horizontal lifelines must only be done by qualified persons. Testing of installed lifelines and anchors prior to use is recommended.

(vii) The strength of an eye-bolt is rated along the axis of the bolt and its strength is greatly reduced if the force is applied at an angle to this axis (in the direction of shear). Also, care should be exercised in selecting the proper diameter of the eye to avoid accidental disengagement of snap-hooks not designed to be compatible for the connection.

(viii) Due to the significant reduction in the strength of the lifeline/lanyard (in some cases, as much as a 70 percent reduction), the sliding hitch knot (prusik) should not be used for lifeline/lanyard connections except in emergency situations where no other available system is practical. The "one-and-one" sliding hitch knot should never be used because it is unreliable in stopping a fall. The "two-and-two," or "three-and-three" knot (preferable) may be used in emergency situations; however, care should be taken to limit free fall distance to a minimum because of reduced lifeline/lanyard strength.

(i) Vertical lifeline considerations. As required by the standard, each employee must have a separate lifeline (except employees engaged in constructing elevator shafts who are permitted to have two employees on one lifeline) when the lifeline is vertical. The reason for this is that in multiple tie-offs to a single lifeline, if one employee falls, the movement of the lifeline during the arrest of the fall may pull other employees' lanyards, causing them to fall as well.

(j) Snap-hook considerations.

(i) Although not required by this standard for all connections until January 1, 1998, locking snap-hooks designed for connection to suitable objects (of sufficient strength) are highly recommended in lieu of the nonlocking type. Locking snap-hooks incorporate a positive locking mechanism in addition to the spring loaded keeper, which will not allow the keeper to open under moderate pressure without someone first releasing the mechanism. Such a feature, properly designed, effectively prevents roll-out from occurring.

(ii) As required by WAC 296-155-24505 (4)(f), the following connections must be avoided (unless properly designed locking snap-hooks are used) because they are conditions which can result in roll-out when a nonlocking snap-hook is used:

(A) Direct connection of a snap-hook to a horizontal lifeline.

(B) Two (or more) snap-hooks connected to one dee-ring.

(C) Two snap-hooks connected to each other.

(D) A snap-hook connected back on its integral lanyard.

(E) A snap-hook connected to a webbing loop or webbing lanyard.

(F) Improper dimensions of the dee-ring, rebar, or other connection point in relation to the snap-hook dimensions

which would allow the snap-hook keeper to be depressed by a turning motion of the snap-hook.

(k) Free fall considerations. The employer and employee should at all times be aware that a system's maximum arresting force is evaluated under normal use conditions established by the manufacturer, and in no case using a free fall distance in excess of 6 feet (1.8 m). A few extra feet of free fall can significantly increase the arresting force on the employee, possibly to the point of causing injury. Because of this, the free fall distance should be kept at a minimum, and, as required by the standard, in no case greater than 6 feet (1.8 m). To help assure this, the tie-off attachment point to the lifeline or anchor should be located at or above the connection point of the fall arrest equipment or harness. (Since otherwise additional free fall distance is added to the length of the connecting means (i.e. lanyard)). Attaching to the working surface will often result in a free fall greater than 6 feet (1.8 m). For instance, if a 6-foot (1.8 m) lanyard is used, the total free fall distance will be the distance from the working level to the harness attachment point plus the 6 feet (1.8 m) of lanyard length. Another important consideration is that the arresting force which the fall-arrest system must withstand also goes up with greater distances of free fall, possibly exceeding the strength of the system.

(l) Elongation and deceleration distance considerations. Other factors involved in a proper tie-off are elongation and deceleration distance. During the arresting of a fall, a lanyard will experience a length of stretching or elongation, whereas activation of a deceleration device will result in a certain stopping distance. These distances should be available with the lanyard or device's instructions and must be added to the free fall distance to arrive at the total fall distance before an employee is fully stopped. The additional stopping distance may be very significant if the lanyard or deceleration device is attached near or at the end of a long lifeline, which may itself add considerable distance due to its own elongation. As required by the standard, sufficient distance to allow for all of these factors must also be maintained between the employee and obstructions below, to prevent an injury due to impact before the system fully arrests the fall. In addition, a minimum of 12 feet (3.7 m) of lifeline should be allowed below the securing point of a rope grab type deceleration device, and the end terminated to prevent the device from sliding off the lifeline. Alternatively, the lifeline should extend to the ground or the next working level below. These measures are suggested to prevent the worker from inadvertently moving past the end of the lifeline and having the rope grab become disengaged from the lifeline.

(m) Obstruction considerations. The location of the tie-off should also consider the hazard of obstructions in the potential fall path of the employee. Tie-offs which minimize the possibilities of exaggerated swinging should be considered. Thus, obstructions which might interfere with this motion should be avoided or a severe injury could occur.

(n) Other considerations. Because of the design of some personal fall arrest systems, additional considerations may be required for proper tie-off. For example, heavy deceleration devices of the self-retracting type should be secured overhead in order to avoid the weight of the device

having to be supported by the employee. In all cases, manufacturer's instructions should be followed.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24521, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24521, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24522 Appendix D to Part C-1—Positioning device systems nonmandatory guidelines for complying with WAC 296-155-24505(6). (1) Testing methods for positioning device systems. This Appendix serves as a nonmandatory guideline to assist employers in complying with the requirements for positioning device systems in WAC 296-155-24505(6). Subdivisions (b), (c), (d) and (e) of Appendix C of Part C-1 relating to WAC 296-155-24505(4)—Personal fall arrest systems—set forth test procedures which may be used, along with the procedures listed below, to determine compliance with the requirements for positioning device systems in WAC 296-155-24505 (6)(c) and (d) of Part C-1.

(a) General. Single strap positioning devices shall have one end attached to a fixed anchorage and the other end connected to a body belt or harness in the same manner as they would be used to protect employees. Double strap positioning devices, similar to window cleaner's belts, shall have one end of the strap attached to a fixed anchorage and the other end shall hang free. The body belt or harness shall be attached to the strap in the same manner as it would be used to protect employees. The two strap ends shall be adjusted to their maximum span.

(b) The fixed anchorage shall be rigid, and shall not have a deflection greater than .04 inches (1 mm) when a force of 2,250 pounds (10 kN) is applied.

(c) During the testing of all systems, a test weight of 250 pounds plus or minus 3 pounds (113 kg plus or minus 1.6 kg) shall be used. The weight shall be a rigid object with a girth of 38 inches plus or minus 4 inches (96 cm plus or minus 10 cm).

(d) Each test shall consist of dropping the specified weight one time without failure of the system being tested. A new system shall be used for each test.

(e) The test weight for each test shall be hoisted exactly 4 feet (1.2 m) above its "at rest" position, and shall be dropped so as to permit a vertical free fall of 4 feet (1.2 m).

(f) The test is failed whenever any breakage or slippage occurs which permits the weight to fall free of the system.

(g) Following the test, the system need not be capable of further operation; however, all such incapacities shall be readily apparent.

(2) Inspection considerations. As required in WAC 296-155-24505 (6)(e), positioning device systems must be regularly inspected. Any component with any significant defect, such as cuts, tears, abrasions, mold, or undue stretching; alterations or additions which might affect its efficiency; damage due to deterioration; contact with fire, acids, or other corrosives; distorted hooks or faulty hook springs; tongues unfitted to the shoulder of buckles; loose or damaged mountings; non-functioning parts; or wearing or internal deterioration in the ropes must be withdrawn from service immediately, and should be tagged or marked as unusable, or destroyed.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24522, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24523 Appendix E to Part C-1—Sample fall protection plan nonmandatory guidelines for complying with WAC 296-155-24505(12). Employers engaged in leading edge work, precast concrete construction work and residential construction work who can demonstrate that it is infeasible or creates a greater hazard to use conventional fall protection systems must develop and follow a fall protection plan. Below are sample fall protection plans developed for precast concrete construction and residential work that could be tailored to be site specific for other precast concrete or residential job sites. This sample plan can be modified to be used for other work involving leading edge work. The sample plan outlines the elements that must be addressed in any fall protection plan. The reasons outlined in this sample fall protection plan are for illustrative purposes only and are not necessarily a valid, acceptable rationale (unless the conditions at the job site are the same as those covered by these sample plans) for not using conventional fall protection systems for a particular precast concrete or residential construction worksite. However, the sample plans provide guidance to employers on the type of information that is required to be discussed in fall protection plans.

Sample Fall Protection Plans

Fall Protection Plan For Precast/Prestress Concrete Structures

This Fall Protection Plan is specific for the following project:

Location of Job
Erecting Company
Date Plan Prepared or Modified
Plan Prepared By
Plan Approved By
Plan Supervised By

The following Fall Protection Plan is a sample program prepared for the prevention of injuries associated with falls. A Fall Protection Plan must be developed and evaluated on a site by site basis. It is recommended that erectors discuss the written Fall Protection Plan with their WISHA Regional Office prior to going on a job site.

(1) Statement of Company Policy: (Company Name) is dedicated to the protection of its employees from on-the-job injuries. All employees of (Company Name) have the responsibility to work safely on the job. The purpose of this plan is:

(a) To supplement our standard safety policy by providing safety standards specifically designed to cover fall protection on this job and;

(b) To ensure that each employee is trained and made aware of the safety provisions which are to be implemented by this plan prior to the start of erection.

This fall protection plan addresses the use of other than conventional fall protection at a number of areas on the project, as well as identifying specific activities that require nonconventional means of fall protection.

These areas include:

Connecting activity (point of erection).
 Leading edge work.
 Unprotected sides or edge.
 Grouting.

This plan is designed to enable employers and employees to recognize the fall hazards on this job and to establish the procedures that are to be followed in order to prevent falls to lower levels or through holes and openings in walking/working surfaces. Each employee will be trained in these procedures and strictly adhere to them except when doing so would expose the employee to a greater hazard. If, in the employee's opinion, this is the case, the employee is to notify the supervisor of the concern and the concern addressed before proceeding.

Safety policy and procedure on any one project cannot be administered, implemented, monitored and enforced by any one individual. The total objective of a safe, accident free work environment can only be accomplished by a dedicated, concerted effort by every individual involved with the project from management down to the last employee. Each employee must understand their value to the company; the costs of accidents, both monetary, physical, and emotional; the objective of the safety policy and procedures; the safety rules that apply to the safety policy and procedures; and what their individual role is in administering, implementing, monitoring, and compliance of their safety policy and procedures. This allows for a more personal approach to compliance through planning, training, understanding and cooperative effort, rather than by strict enforcement. If for any reason an unsafe act persists, strict enforcement will be implemented.

It is the responsibility of (name of Competent Person) to implement this Fall Protection Plan. (Name of Competent Person) is responsible for continual observational safety checks of their work operations and to enforce the safety policy and procedures. The foreman also is responsible to correct any unsafe acts or conditions immediately. It is the responsibility of the employee to understand and adhere to the procedures of this plan and to follow the instructions of the foreman. It is also the responsibility of the employee to bring to management's attention any unsafe or hazardous conditions or acts that may cause injury to either themselves or any other employees. Any changes to this Fall Protection Plan must be approved by (name of Qualified Person).

(2) Fall Protection Systems to be Used on This Project: Where conventional fall protection is infeasible or creates a greater hazard at the leading edge and during initial connecting activity, we plan to do this work using a safety monitoring system and expose only a minimum number of employees for the time necessary to actually accomplish the job. The maximum number of workers to be monitored by one safety monitor is eight (8). We are designating the following trained employees as designated erectors and they are permitted to enter the controlled access zones and work without the use of conventional fall protection.

Safety monitor:

Designated erector:

Designated erector:

Designated erector:

Designated erector:

Designated erector:

Designated erector:

The safety monitor shall be identified by wearing an orange hard hat. The designated erectors will be identified by one of the following methods:

- (a) They will wear a blue colored arm band, or
- (b) They will wear a blue colored hard hat, or
- (c) They will wear a blue colored vest.

Note: See WAC 296-155-24505 (9)(e).

Only individuals with the appropriate experience, skills, and training will be authorized as designated erectors. All employees that will be working as designated erectors under the safety monitoring system shall have been trained and instructed in the following areas:

(d) Recognition of the fall hazards in the work area (at the leading edge and when making initial connections—point of erection).

(e) Avoidance of fall hazards using established work practices which have been made known to the employees.

(f) Recognition of unsafe practices or working conditions that could lead to a fall, such as windy conditions.

(g) The function, use, and operation of safety monitoring systems, guardrail systems, body belt/harness systems, control zones and other protection to be used.

(h) The correct procedure for erecting, maintaining, disassembling and inspecting the system(s) to be used.

(i) Knowledge of construction sequence or the erection plan. A conference will take place prior to starting work involving all members of the erection crew, crane crew and supervisors of any other concerned contractors. This conference will be conducted by the precast concrete erection supervisor in charge of the project. During the pre-work conference, erection procedures and sequences pertinent to this job will be thoroughly discussed and safety practices to be used throughout the project will be specified. Further, all personnel will be informed that the controlled access zones are off limits to all personnel other than those designated erectors specifically trained to work in that area.

(3) Safety Monitoring System: A safety monitoring system means a fall protection system in which a competent person is responsible for recognizing and warning employees of fall hazards. The duties of the safety monitor are to:

(a) Warn by voice when approaching the open edge in an unsafe manner.

(b) Warn by voice if there is a dangerous situation developing which cannot be seen by another person involved with product placement, such as a member getting out of control.

(c) Make the designated erectors aware they are in a dangerous area.

(d) Be competent in recognizing fall hazards.

(e) Warn employees when they appear to be unaware of a fall hazard or are acting in an unsafe manner.

(f) Be on the same walking/working surface as the monitored employees and within visual sighting distance of the monitored employees.

(g) Be close enough to communicate orally with the employees.

(h) Not allow other responsibilities to encumber monitoring.

(i) The safety monitoring system shall not be used when the wind is strong enough to cause loads with large surface areas to swing out of radius, or result in loss of control of the load, or when weather conditions cause the walking/working surfaces to become icy or slippery.

(4) Control Zone System: A controlled access zone means an area designated and clearly marked, in which leading edge work may take place without the use of guardrail, safety net or personal fall arrest systems to protect the employees in the area. Control zone systems shall comply with the following provisions:

(a) When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access. When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 60 feet (18 m) or half the length of the member being erected, whichever is less, from the leading edge.

(b) The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

(c) The control line shall be connected on each side to a guardrail system or wall.

(d) Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:

(e) Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.

(f) Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m) from the walking/working surface.

(g) Each line shall have a minimum breaking strength of 200 pounds (.88 kN).

(5) Holes: All openings greater than 2 in. x 2 in. will have perimeter guarding or covering. All predetermined holes will have the plywood covers made in the precasters' yard and shipped with the member to the job site. Prior to cutting holes on the job, proper protection for the hole must be provided to protect the workers. Perimeter guarding or covers will not be removed without the approval of the erection supervisor.

Precast concrete column erection through the existing deck requires that many holes be provided through this deck. These are to be covered and protected. Except for the opening being currently used to erect a column, all opening protection is to be left undisturbed. The opening being uncovered to erect a column will become part of the point of erection and will be addressed as part of this Fall Protection Plan. This uncovering is to be done at the erection supervisor's direction and will only occur immediately prior to "feeding" the column through the opening. Once the end of the column is through the slab opening, there will no longer exist a fall hazard at this location.

(6) Implementation of Fall Protection Plan: The structure being erected is a multistory total precast concrete building consisting of columns, beams, wall panels and hollow core slabs and double tee floor and roof members. The following is a list of the products and erection situations on this job:

(a) Columns: For columns 10 ft to 36 ft long, employees disconnecting crane hooks from columns will work from a ladder and wear a harness with lanyard and be tied off when both hands are needed to disconnect. For tying off, a vertical lifeline will be connected to the lifting eye at the top of the column, prior to lifting, to be used with a manually operated or mobile rope grab. For columns too high for the use of a ladder, 36 ft and higher, an added cable will be used to reduce the height of the disconnecting point so that a ladder can be used. This cable will be left in place until a point in erection that it can be removed safely. In some cases, columns will be unhooked from the crane by using an erection tube or shackle with a pull pin which is released from the ground after the column is stabilized. The column will be adequately connected and/or braced to safely support the weight of a ladder with an employee on it.

(b) Inverted Tee Beams: Employees erecting inverted tee beams, at a height of 4 to 40 ft, will erect the beam, make initial connections, and final alignment from a ladder. If the employee needs to reach over the side of the beam to bar or make an adjustment to the alignment of the beam, they will mount the beam and be tied off to the lifting device in the beam after ensuring the load has been stabilized on its bearing. To disconnect the crane from the beam an employee will stand a ladder against the beam. Because the use of ladders is not practical at heights above 40 ft, beams will be initially placed with the use of tag lines and their final alignment made by a person on a manlift or similar employee positioning systems.

(c) Spandrel Beams: Spandrel beams at the exterior of the building will be aligned as closely as possible with the use of tag lines with the final placement of the spandrel beam made from a ladder at the open end of the structure. A ladder will be used to make the initial connections and a ladder will be used to disconnect the crane. The other end of the beam will be placed by the designated erector from the double tee deck under the observation of the safety monitor.

The beams will be adequately connected and/or braced to safely support the weight of a ladder with an employee on it.

(d) Floor and Roof Members: During installation of the precast concrete floor and/or roof members, the work deck continuously increases in area as more and more units are being erected and positioned. Thus, the unprotected floor/roof perimeter is constantly modified with the leading edge changing location as each member is installed. The fall protection for workers at the leading edge shall be assured by properly constructed and maintained control zone lines not more than 60 ft away from the leading edge supplemented by a safety monitoring system to ensure the safety of all designated erectors working within the area defined by the control zone lines.

The hollow core slabs erected on the masonry portion of the building will be erected and grouted using the safety monitoring system. Grout will be placed in the space between the end of the slab and face shell of the concrete masonry by dumping from a wheelbarrow. The grout in the keyways between the slabs will be dumped from a wheelbarrow and then spread with long handled tools, allowing the worker to stand erect facing toward the unprotected edge and back from any work deck edge.

Whenever possible, the designated erectors will approach the incoming member at the leading edge only after it is below waist height so that the member itself provides protection against falls.

Except for the situations described below, when the arriving floor or roof member is within 2 to 3 inches of its final position, the designated erectors can then proceed to their position of erection at each end of the member under the control of the safety monitor. Crane hooks will be unhooked from double tee members by designated erectors under the direction and supervision of the safety monitor.

Designated erectors, while waiting for the next floor or roof member, will be constantly under the control of the safety monitor for fall protection and are directed to stay a minimum of six ft from the edge. In the event a designated erector must move from one end of a member, which has just been placed at the leading edge, they must first move away from the leading edge a minimum of six ft and then progress to the other end while maintaining the minimum distance of six feet at all times.

Horizontal cables used as an anchorage present an additional hazard due to amplification of the horizontal component of maximum arrest force (of a fall) transmitted to the points where the horizontal cable is attached to the structure. This amplification is due to the angle of sag of a horizontal cable and is most severe for small angles of sag. For a cable sag angle of 2 degrees the horizontal force on the points of cable attachment can be amplified by a factor of 15.

It is also necessary to install the retractable device vertically overhead to minimize swing falls. If an object is in the worker's swing path (or that of the cable) hazardous situations exist: (i) Due to the swing, horizontal speed of the user may be high enough to cause injury when an obstacle in the swing fall path is struck by either the user or the cable; (ii) the total vertical fall distance of the user may be much greater than if the user had fallen only vertically without a swing fall path.

With retractable lines, overconfidence may cause the worker to engage in inappropriate behavior, such as approaching the perimeter of a floor or roof at a distance appreciably greater than the shortest distance between the anchorage point and the leading edge. Though the retractable lifeline may arrest a worker's fall before he or she has fallen a few feet, the lifeline may drag along the edge of the floor or beam and swing the worker like a pendulum until the line has moved to a position where the distance between the anchorage point and floor edge is the shortest distance between those two points. Accompanying this pendulum swing is a lowering of the worker, with the attendant danger that he or she may violently impact the floor or some obstruction below.

The risk of a cable breaking is increased if a lifeline is dragged sideways across the rough surface or edge of a concrete member at the same moment that the lifeline is being subjected to a maximum impact loading during a fall.

The typical 3/16 in. cable in a retractable lifeline has a breaking strength of from 3000 to 3700 lbs.

(7) Safety Net Systems: The nature of this particular precast concrete erection worksite precludes the safe use of

safety nets where point of erection or leading edge work must take place.

(a) To install safety nets in the interior high bay of the single story portion of the building poses rigging attachment problems. Structural members do not exist to which supporting devices for nets can be attached in the area where protection is required. As the erection operation advances, the location of point of erection or leading edge work changes constantly as each member is attached to the structure. Due to this constant change it is not feasible to set net sections and build separate structures to support the nets.

(b) The nature of the erection process for the precast concrete members is such that an installed net would protect workers as they position and secure only one structural member. After each member is stabilized the net would have to be moved to a new location (this could mean a move of 8 to 10 ft or the possibility of a move to a different level or area of the structure) to protect workers placing the next piece in the construction sequence. The result would be the installation and dismantling of safety nets repeatedly throughout the normal work day. As the time necessary to install a net, test, and remove it is significantly greater than the time necessary to position and secure a precast concrete member, the exposure time for the worker installing the safety net would be far longer than for the workers whom the net is intended to protect. The time exposure repeats itself each time the nets and supporting hardware must be moved laterally or upward to provide protection at the point of erection or leading edge.

(c) Strict interpretation of WAC 296-155-24505(3) requires that operations shall not be undertaken until the net is in place and has been tested. With the joint of erection constantly changing, the time necessary to install and test safety net significantly exceeds the time necessary to position and secure the concrete member.

(d) Use of safety nets on exposed perimeter wall openings and openings in floors, causes attachment points to be left in architectural concrete which must be patched and filled with matching material after the net supporting hardware is removed. In order to patch these openings, additional numbers of employees must be suspended by swing stages, boatswain chairs or other devices, thereby increasing the amount of fall exposure time to employees.

(e) Installed safety nets pose an additional hazard at the perimeter of the erected structure where limited space is available in which members can be turned after being lifted from the ground by the crane. There would be a high probability that the member being lifted could become entangled in net hardware, cables, etc.

(f) The use of safety nets where structural wall panels are being erected would prevent movement of panels to point of installation. To be effective, nets would necessarily have to provide protection across the area where structural supporting wall panels would be set and plumbed before roof units could be placed.

(g) Use of a tower crane for the erection of the high rise portion of the structure poses a particular hazard in that the crane operator cannot see or judge the proximity of the load in relation to the structure or nets. If the signaler is looking through nets and supporting structural devices while giving

instructions to the crane operator, it is not possible to judge precise relationships between the load and the structure itself or to nets and supporting structural devices. This could cause the load to become entangled in the net or hit the structure causing potential damage.

(8) Other Fall Protection Measures Considered for This Job: The following is a list of other fall protection measures available or that could be used or that could be used on this particular job site. If during the course of erecting the building the employee sees an area that could be erected more safely by the use of these fall protection measures, the supervisor should be notified.

- Scaffolds
- Vehicle mounted platforms
- Crane suspended personnel platforms

(9) Enforcement: Constant awareness of and respect for fall hazards, and compliance with all safety rules are considered conditions of employment. The job site Superintendent, as well as individuals in the Safety and Personnel Department, reserve the right to issue disciplinary warnings to employees, up to and including termination, for failure to follow the guidelines of this program.

(10) Accident Investigations: All accidents that result in injury to workers, regardless of their nature, shall be investigated and reported. It is an integral part of any safety program that documentation take place as soon as possible so that the cause and means of prevention can be identified to prevent a recurrence. In the event that an employee falls or there is some other related, serious incident occurring, this plan shall be reviewed to determine if additional practices, procedures, or training need to be implemented to prevent similar types of falls or incidents from occurring.

(11) Changes to Plan: Any changes to the plan will be approved by (name of the qualified person). This plan shall be reviewed by a qualified person as the job progresses to determine if additional practices, procedures or training needs to be implemented by the competent person to improve or provide additional fall protection. Workers shall be notified and trained, if necessary, in the new procedures. A copy of this plan and all approved changes shall be maintained at the job site.

(12) Sample fall protection plan for residential construction. This sample fall protection work plan example is only applicable when work is being done between six and ten feet above the adjacent ground or floor level.

(Insert Company Name)

This fall protection plan is specific for the following project:

Location of Job
Date Plan Prepared or Modified
Plan Prepared By
Plan Approved By
Plan Supervised By

The following fall protection plan is a sample program prepared for the prevention of injuries associated with falls. A fall protection plan must be developed and evaluated on a site by site basis. It is recommended that builders discuss the written fall protection plan with their WISHA Region Office prior to going on a job site.

(a) Statement of Company Policy: (Your company name here) is dedicated to the protection of its employees from on-the-job injuries. All employees of (Your company name here) have the responsibility to work safely on the job. The purpose of the plan is to supplement our existing safety and health program and to ensure that every employee who works for (Your company name here) recognizes workplace fall hazards and takes the appropriate measures to address those hazards.

This fall protection plan addresses the use of conventional fall protection at a number of areas on the project, as well as identifies specific activities that require non-conventional means of fall protection. During the construction of residential buildings and working between a height of six and ten feet above the adjacent ground or floor, it is sometimes infeasible or it creates a greater hazard to use conventional fall protection systems at specific areas or for specific tasks. The areas or tasks may include, but are not limited to:

- Setting and bracing of roof trusses and rafters;
- Installation of floor sheathing and joists;
- Roof sheathing operations; and
- Erecting exterior walls.

In these cases, conventional fall protection systems may not be the safest choice for builders. This plan is designed to enable employers and employees to recognize the fall hazards associated with this job and to establish the safest procedures that are to be followed in order to prevent falls to lower levels or through holes and openings in walking/working surfaces.

Each employee will be trained in these procedures and will strictly adhere to them except when doing so would expose the employee to a greater hazard. If, in the employee's opinion, this is the case, the employee is to notify the competent person of their concern and have the concern addressed before proceeding.

It is the responsibility of (name of competent person) to implement this fall protection plan. Continual observational safety checks of work operations and the enforcement of the safety policy and procedures shall be regularly enforced. The crew supervisor or leader (insert name) is responsible for correcting any unsafe practices or conditions immediately.

It is the responsibility of the employer to ensure that all employees understand and adhere to the procedures of this plan and to follow the instructions of the crew supervisor. It is also the responsibility of the employee to bring to management's attention any unsafe or hazardous conditions or practices that may cause injury to either themselves or any other employees. Any changes to the Fall Protection Plan must be approved by (name of qualified person).

(b) Fall Protection Systems to be Used on This Job: Installation of roof trusses/rafters, exterior wall erection, roof sheathing, floor sheathing and joist/truss activities will be conducted by employees who are specifically trained to do this type of work and are trained to recognize the fall hazards. The nature of such work normally exposes the employee to the fall hazard for a short period of time. This Plan details how (Your company name here) will minimize these hazards.

(i) Controlled Access Zones: When using the Plan to implement the fall protection options available, workers must be protected through limited access to high hazard locations.

Before any non-conventional fall protection systems are used as part of the work plan, a controlled access zone (CAZ) shall be clearly defined by the competent person as an area where a recognized hazard exists. The demarcation of the CAZ shall be communicated by the competent person in a recognized manner, either through signs, wires, tapes, ropes or chains. (Your company name here) shall take the following steps to ensure that the CAZ is clearly marked or controlled by the competent person:

- All access to the CAZ must be restricted to authorized entrants;

- All workers who are permitted in the CAZ shall be listed in the appropriate sections of the Plan (or be visibly identifiable by the competent person) prior to implementation;

The competent person shall ensure that all protective elements of the CAZ be implemented prior to the beginning of work.

(ii) Installation Procedures for Roof Truss and Rafter Erection: During the erection and bracing of roof trusses/rafters, conventional fall protection may present a greater hazard to workers when working between 6 and 10 feet. On this job, safety nets will not provide adequate fall protection because the nets will cause the walls to collapse.

On this job, requiring workers to use a ladder for the entire installation process will cause a greater hazard because the worker must stand on the ladder with their back or side to the front of the ladder. While erecting the truss or rafter the worker will need both hands to maneuver the truss and therefore cannot hold onto the ladder. In addition, ladders cannot be adequately protected from movement while trusses are being maneuvered into place. Many workers may experience additional fatigue because of the increase in overhead work with heavy materials, which can also lead to a greater hazard.

Exterior scaffolds cannot be utilized on this job because the ground, after recent backfilling, cannot support the scaffolding. In most cases, the erection and dismantling of the scaffold would expose workers to a greater fall hazard than erection of the trusses/rafters.

On all walls eight feet or less, workers will install interior scaffolds along the interior wall below the location where the trusses/rafters will be erected. "Sawhorse" scaffolds constructed of 46 inch sawhorses and 2 x 10 planks will often allow workers to be elevated high enough to allow for the erection of trusses and rafters without working on the top plate of the wall.

In structures that have walls higher than eight feet and where the use of scaffolds and ladders would create a greater hazard, safe working procedures will be utilized when working on the top plate and will be monitored by the crew supervisor. During all stages of truss/rafter erection the stability of the trusses/rafters will be ensured at all times.

(Your company name here) shall take the following steps to protect workers who are exposed to fall hazards while working from the top plate installing trusses/rafters:

- Only the following trained workers will be allowed to work on the top plate during roof truss or rafter installation:

.....

- Workers shall have no other duties to perform during truss/rafter erection procedures;

- All trusses/rafters will be adequately braced before any worker can use the truss/rafter as a support;

- Workers will remain on the top plate using the previously stabilized truss/rafter as a support while other trusses/rafters are being erected;

- Workers will leave the area of the secured trusses only when it is necessary to secure another truss/rafter;

- The first two trusses/rafters will be set from ladders leaning on side walls at points where the walls can support the weight of the ladder; and

- A worker will climb onto the interior top plate via a ladder to secure the peaks of the first two trusses/rafters being set.

The workers responsible for detaching trusses from cranes and/or securing trusses at the peaks traditionally are positioned at the peak of the trusses/rafters. There are also situations where workers securing rafters to ridge beams will be positioned on top of the ridge beam.

(Your company name here) shall take the following steps to protect workers who are exposed to fall hazards while securing trusses/rafters at the peak of the trusses/ridge beam:

- Only the following trained workers will be allowed to work at the peak during roof truss or rafter installation:

.....

- Once truss or rafter installation begins, workers not involved in that activity shall not stand or walk below or adjacent to the roof opening or exterior walls in any area where they could be struck by falling objects;

- Workers shall have no other duties than securing/bracing the trusses/ridge beam;

- Workers positioned at the peaks or in the webs of trusses or on top of the ridge beam shall work from a stable position, either by sitting on a "ridge seat" or other equivalent surface that provides additional stability or by positioning themselves in previously stabilized trusses/rafters and leaning into and reaching through the trusses/rafters;

- Workers shall not remain on or in the peak/ridge any longer than necessary to safely complete the task.

(iii) Roof Sheathing Operations: Workers typically install roof sheathing after all trusses/rafters and any permanent truss bracing is in place. Roof structures are unstable until some sheathing is installed, so workers installing roof sheathing cannot be protected from fall hazards by conventional fall protection systems until it is determined that the roofing system can be used as an anchorage point. At that point, employees shall be protected by a personal fall arrest system.

Trusses/rafters are subject to collapse if a worker falls while attached to a single truss with a harness. Nets could also cause collapse, and there is no place to attach guardrails.

All workers will ensure that they have secure footing before they attempt to walk on the sheathing, including cleaning shoes/boots of mud or other slip hazards.

To minimize the time workers must be exposed to a fall hazard, materials will be staged to allow for the quickest installation of sheathing.

(Your company name here) shall take the following steps to protect workers who are exposed to fall hazards while installing roof sheathing:

- Once roof sheathing installation begins, workers not involved in that activity shall not stand or walk below or adjacent to the roof opening or exterior walls in any area where they could be struck by falling objects;

- The competent person shall determine the limits of this area, which shall be clearly communicated to workers prior to placement of the first piece of roof sheathing;

- The competent person may order work on the roof to be suspended for brief periods as necessary to allow other workers to pass through such areas when this would not create a greater hazard;

- Only qualified workers shall install roof sheathing;

- The bottom row of roof sheathing may be installed by workers standing in truss webs;

- After the bottom row of roof sheathing is installed, a slide guard extending the width of the roof shall be securely attached to the roof. Slide guards are to be constructed of no less than nominal 4" height capable of limiting the uncontrolled slide of workers. Workers should install the slide guard while standing in truss webs and leaning over the sheathing;

- Additional rows of roof sheathing may be installed by workers positioned on previously installed rows of sheathing. A slide guard can be used to assist workers in retaining their footing during successive sheathing operations; and

- Additional slide guards shall be securely attached to the roof at intervals not to exceed 13 feet as successive rows of sheathing are installed. For roofs with pitches in excess of 9-in-12, slide guards will be installed at four-foot intervals.

- When wet weather (rain, snow, or sleet) are present, roof sheathing operations shall be suspended unless safe footing can be assured for those workers installing sheathing.

- When strong winds are present, roof sheathing operations are to be suspended unless wind breakers are erected.

(iv) Installation of Floor Joists and Sheathing: During the installation of floor sheathing/joists (leading edge construction), the following steps shall be taken to protect workers:

- Only the following trained workers will be allowed to install floor joists or sheathing:

.....

- Materials for the operations shall be conveniently staged to allow for easy access to workers;

- The first floor joists or trusses will be rolled into position and secured either from the ground, ladders or sawhorse scaffolds;

- Each successive floor joist or truss will be rolled into place and secured from a platform created from a sheet of plywood laid over the previously secured floor joists or trusses;

- Except for the first row of sheathing which will be installed from ladders or the ground, workers shall work from the established deck; and

- Any workers not assisting in the leading edge construction while leading edges still exist (e.g. cutting the decking for the installers) shall not be permitted within six feet of the leading edge under construction.

(v) Erection of Exterior Walls: During the construction and erection of exterior walls, employers shall take the following steps to protect workers:

- Only the following trained workers will be allowed to erect exterior walls:

.....

- A painted line six feet from the perimeter will be clearly marked prior to any wall erection activities to warn of the approaching unprotected edge;

- Materials for operations shall be conveniently staged to minimize fall hazards; and

- Workers constructing exterior walls shall complete as much cutting of materials and other preparation as possible away from the edge of the deck.

(vi) Enforcement: Constant awareness of and respect for fall hazards, and compliance with all safety rules are considered conditions of employment. The crew supervisor or leader, as well as individuals in the safety and personnel department, reserve the right to issue disciplinary warnings to employees, up to and including termination, for failure to follow the guidelines of this program.

(vii) Accident Investigations: All accidents that result in injury to workers, regardless of their nature, shall be investigated and reported. It is an integral part of any safety program that documentation take place as soon as possible so that the cause and means of prevention can be identified to prevent a reoccurrence.

In the event that an employee falls or there is some other related, serious incident occurring, this plan shall be reviewed to determine if additional practices, procedures, or training need to be implemented to prevent similar types of falls or incidents from occurring.

(viii) Changes to Plan: Any changes to the plan will be approved by (name of the qualified person). This plan shall be reviewed by a qualified person as the job progresses to determine if additional practices, procedures or training needs to be implemented by the competent person to improve or provide additional fall protection. Workers shall be notified and trained, if necessary, in the new procedures. A copy of this plan and all approved changes shall be maintained at the job site.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24523, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24524 Appendix F to Part C-1, fall restraint and fall arrest (employer information only). Additional standards that require the use of fall restraint and/or fall arrest protection for employees are listed below:

Ladders	WAC 296-155-480 (1)(o)
	WAC 296-155-480 (1)(p)
Suspended Scaffold	WAC 296-155-485 (7)(h)
Two Points Suspension Scaffold	WAC 296-155-485 (7)(h) and (i)

Boatswain's Chair Scaffold	WAC 296-155-485 (10)(d)
Needle Beam Scaffold	WAC 296-155-485 (14)(i)
Ladder Jack Scaffold	WAC 296-155-485 (17)(f)
Window Jack Scaffold	WAC 296-155-485 (18)(c)
Float or Ship Scaffold	WAC 296-155-485 (21)(f)
Pump Jack Scaffold	WAC 296-155-485 (23)(k)
Boom Supported Elevating Work Platforms	WAC 296-155-48529 (19)(b)(vi)
Vehicle Mounted Elevated and Rotating Work Platforms	WAC 296-155-48531 (14)(h)
Crane and Derrick Supported Work Platforms	WAC 296-155-48533 (6)(c)
	WAC 296-155-48533 (6)(d)
	WAC 296-155-48533 (7)(i)
	WAC 296-155-48533 (7)(j)
	WAC 296-155-48533 (7)(k)
	WAC 296-155-48533 (10)(h)
Pile Driving	WAC 296-155-620 (1)(i)
Vertical Slip Forms	WAC 296-155-688(9)
Placing and Removal of Forms	WAC 296-155-689(4)
Steel Erection Temporary Floors	WAC 296-155-705 (2)(b)
Tunneling (Skips and Platforms)	WAC 296-155-730(8)

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24524, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24525 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24525, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24525, filed 1/10/91, effective 2/12/91.]

WAC 296-155-325 General requirements for storage. (1) General.

(a) All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.

(b) Maximum safe load limits of floors within buildings and structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe loads shall not be exceeded.

(c) Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or employees. Such areas shall be kept in good repair.

(d) When a difference in road or working levels exist, means such as ramps, blocking, or grading shall be used to ensure the safe movement of vehicles between the two levels.

(2) Material storage.

(a)(i) Material stored inside buildings under construction shall not be placed within 6 feet of any hoistway or inside floor openings, nor within 10 feet of an exterior wall which does not extend above the top of the material stored.

(ii) Temporary floors, used in steel erection, concrete forms and shoring (i.e., stripped forms, shoring jacks, clamps, steel rods or pipes, base plates, etc.) placed within close proximity to an open-sided floor for movement to another tier for placement, shall be considered "in-process equipment and subject to the provisions contained in Parts "O" and "P" of this standard. When this type equipment is to be left overnight or for longer periods of time it shall be anchored and braced to prevent displacement in any direction. In addition this equipment shall be subject to the provisions of this subsection while in "interim storage."

(b) Each employee required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be

equipped with personal fall arrest equipment meeting the requirements of chapter 296-155 WAC, Part C-1.

(c) Noncompatible materials shall be segregated in storage.

(d) Bagged materials shall be stacked by stepping back the layers and cross-keying the bags at least every 10 bags high.

(i) When cement and lime is delivered in paper bags they shall be carefully handled to prevent the bags bursting.

(ii) Cement and lime bags shall not be piled more than ten bags high except when stored in bins or enclosures built for the purpose of storage.

(iii) When bags are removed from the pile, the length of the pile shall be kept at an even height, and the necessary step backs every five bags maintained.

(iv) Persons handling cement and lime bags shall wear eye protection which prevents contact between the substance and the worker's eyes (such as goggles or other sealed eye protection) and shall wear long sleeve shirts with close fitting collar and cuffs.

(v) Persons shall be warned against wearing clothing that has become hard and stiff with cement.

(vi) Persons shall be instructed to report any susceptibility of their skin to cement and lime burns.

(vii) A hand cream or vaseline and eye wash shall be provided and kept ready for use to prevent burns.

(viii) Lime shall be stored in a dry place to prevent a premature slacking action that may cause fire.

(e) Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.

(f) Brick stacks shall not be more than 7 feet in height. When a loose brick stack reaches a height of 4 feet, it shall be tapered back 2 inches in every foot of height above the 4-foot level.

(i) Brick shall never be stacked, for storage purposes, on scaffolds or runways.

(ii) When delivering brick on scaffolds inside the wall lines in wheelbarrows, they shall be dumped toward the inside of the building and not toward the wall.

(iii) Blocks shall always be stacked and not thrown in a loose pile.

(g) When masonry blocks are stacked higher than 6 feet, the stack shall be tapered back one-half block per tier above the 6-foot level.

(i) When blocks are stacked inside a building, the piles shall be so distributed as not to overload the floor on which they stand.

(ii) Blocks shall not be dropped or thrown from an elevation or delivered through chutes.

(h) Lumber:

(i) Used lumber shall have all nails withdrawn before stacking.

(ii) Lumber shall be stacked on level and solidly supported sills.

(iii) Lumber shall be so stacked as to be stable and self-supporting.

(iv) Lumber stacks shall not exceed 20 feet in height provided that lumber to be handled manually shall not be stacked more than 16 feet high.

(v) All stored lumber shall be stacked on timber sills to keep it off the ground. Sills shall be placed level on solid supports.

(vi) Cross strips shall be placed in the stacks when they are stacked more than four feet high.

(i) Structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, shall be stacked and blocked so as to prevent spreading or tilting.

(i) Persons handling reinforcing steel shall wear heavy gloves.

(ii) When bending of reinforcing steel is done on the job, a strong bench shall be provided, set up on even dry ground or a floor for the persons to work on.

(iii) Structural steel shall be carefully piled to prevent danger of members rolling off or the pile toppling over.

(iv) Structural steel shall be kept in low piles, consideration being given to the sequence of use of the members.

(v) Corrugated and flat iron shall be stacked in flat piles, with the piles not more than four feet high and spacing strips shall be placed between each bundle.

(j) Sand, gravel and crushed stone.

(i) Stock piles shall be frequently inspected to prevent their becoming unsafe by continued adding to or withdrawing from the stock.

(ii) If material becomes frozen, it shall not be removed in a manner that would produce an overhang.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-325, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-325, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-325, filed 1/21/86; Order 74-26, § 296-155-325, filed 5/7/74, effective 6/6/74.]

WAC 296-155-407 Protective clothing. (1) General requirements. Employees exposed to the hazards created by welding, cutting, or brazing operations shall be protected by personal protective equipment in accordance with the requirements of chapter 296-24 WAC, Part A-2 and Part I. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

(2) Specified protective clothing. Protective means which may be employed are as follows:

(a) Except when engaged in light work, all welders should wear flameproof gauntlet gloves.

(b) Flameproof aprons made of leather, or other suitable material may also be desirable as protection against radiated heat and sparks.

(c) Woolen clothing preferable to cotton because it is not so readily ignited and helps protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls should be reasonably free from oil or grease.

(d) Sparks may lodge in rolled-up sleeves or pockets of clothing, or cuffs of overalls or trousers. It is therefore recommended that sleeves and collars be kept buttoned and pockets be eliminated from the front of overalls and aprons. Trousers or overalls should not be turned up on the outside.

Note: For heavy work, fire-resistant leggings, high boots, or other equivalent means should be used.

(e) In production work a sheet metal screen in front of the worker's legs can provide further protection against sparks and molten metal in cutting operations.

(f) Capes or shoulder covers made of leather or other suitable materials should be worn during overhead welding or cutting operations. Leather skull caps may be worn under helmets to prevent head burns.

(g) Where there is exposure to sharp or heavy falling objects, or a hazard of bumping in confined spaces, hard hats or head protectors shall be used.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-407, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-407, filed 1/21/86.]

WAC 296-155-477 Stairways. (1) General. The following requirements apply to all stairways as indicated:

(a) Stairways that will not be a permanent part of the structure on which construction work is being performed shall have landings of not less than 30 inches (76 cm) in the direction of travel and extend at least 22 inches (56 cm) in width at every 12 feet (3.7 m) or less of vertical rise.

(b) Stairs shall be installed between 30 deg. and 50 deg. from horizontal.

(c) In all buildings or structures two or more stories or twenty-four feet or more in height or depth, suitable permanent or temporary stairways shall be installed.

(d) Stairways, ramps or ladders shall be provided at all points where a break in elevation of eighteen inches or more occurs in a frequently traveled passageway, entry or exit.

(e) A minimum of one stairway shall be provided for access and exit for buildings and structures to three stories or thirty-six feet; if more than three stories or thirty-six feet, two or more stairways shall be provided. Where two stairways are provided and work is being performed in the stairways, one shall be maintained clear for access between levels at all times.

(f) Wood frame buildings.

(i) The stairway to a second or higher floor shall be completed before studs are raised to support the next higher floor.

(ii) Roof and attic work areas of all buildings shall be provided with a safe means of access and egress, such as stairways, ramps or ladders.

(iii) Cleats shall not be nailed to studs to provide access to and egress from roof or other work areas.

(g) Steel frame buildings. Stairways shall extend to the uppermost floor that has been planked or decked. Ladders may be used above that point.

(h) Reinforced concrete or composite steel—Concrete buildings. Stairways shall extend to the lowermost floor upon which a complete vertical shoring system is in place. A minimum of two ladders at different locations for each floor may be used above this floor but not to exceed three floors.

(i) Riser height and tread depth shall be uniform within each flight of stairs, including any foundation structure used as one or more treads of the stairs. Variations in riser height or tread depth shall not be over 1/4-inch (0.6 cm) in any stairway system.

(j) Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall

not reduce the effective width of the platform to less than 20 inches (51 cm).

(k) Metal pan landings and metal pan treads, when used, shall be secured in place before filling with concrete or other material.

(l) All parts of stairways shall be free of hazardous projections, such as protruding nails.

(m) Slippery conditions on stairways shall be eliminated before the stairways are used to reach other levels.

(n) Employers are permitted to use alternating tread type stairs as long as they install, use, and maintain the stairs in accordance with manufacturer's recommendations and the following:

(i) The stair must be installed at an angle of seventy degrees or less.

(ii) The stair must be capable of withstanding a minimum uniform load of one hundred pounds per square foot with a design factor of 1.7, and the treads must be capable of carrying a minimum concentrated load of three hundred pounds at the center of any treadspan or exterior arc with a design factor of 1.7. If the stair is intended for greater loading, construction must allow for that loading.

(iii) The stair must be equipped with a handrail on each side to assist the user in climbing or descending.

(o) Due to space limitations, when a permanent stairway must be installed at an angle above fifty degrees, such an installation (commonly called an inclined or ship's ladder) shall have treads, open risers and handrails on both sides.

(p) Where ladders are permitted for access under subsection (1) of this section, means shall be provided for employee hoisting of tools and material, such as a well wheel and hoisting line or the equivalent, so employees will have both hands free for ascending and descending ladders.

(2) Temporary service. The following requirements apply to all stairways as indicated:

(a) Except during stairway construction, foot traffic is prohibited on stairways with pan stairs where the treads and/or landings are to be filled in with concrete or other material at a later date, unless the stairs are temporarily fitted with wood or other solid material at least to the top edge of each pan. Such temporary treads and landings shall be replaced when worn below the level of the top edge of the pan.

(b) Except during stairway construction, foot traffic is prohibited on skeleton metal stairs where permanent treads and/or landings are to be installed at a later date, unless the stairs are fitted with secured temporary treads and landings long enough to cover the entire tread and/or landing area.

(c) Treads for temporary service shall be made of wood or other solid material, and shall be installed the full width and depth of the stair.

(3) Stairrails and handrails. The following requirements apply to all stairways as indicated:

(a) Stairways having four or more risers or rising more than 30 inches (76 cm), whichever is less, shall be equipped with:

(i) At least one handrail; and

(ii) One stairrail system along each unprotected side or edge.

Note: When the top edge of a stairrail system also serves as a handrail, subdivision (g) of this subsection applies.

(b) Winding and spiral stairways shall be equipped with a handrail offset sufficiently to prevent walking on those portions of the stairways where the tread width is less than 6 inches (15 cm).

(c) The height of stairrails shall be as follows:

(i) Stairrails installed after the effective date of this standard, shall be not less than 36 inches (91.5 cm) from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(ii) Stairrails installed before the effective date of this standard, shall be not less than 30 inches (76 cm) nor more than 34 inches (86 cm) from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(d) Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members, shall be provided between the top rail of the stairrail system and the stairway steps.

(i) Midrails, when used, shall be located at a height midway between the top edge of the stairrail system and the stairway steps.

(ii) Screens or mesh, when used, shall extend from the top rail to the stairway step, and along the entire opening between top rail supports.

(iii) When intermediate vertical members, such as balusters, are used between posts, they shall be not more than 19 inches (48 cm) apart.

(iv) Other structural members, when used, shall be installed such that there are no openings in the stairrail system that are more than 19 inches (48 cm) wide.

(e) Handrails and the top rails of stairrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890 n) applied within 2 inches (5 cm) of the top edge, in any downward or outward direction, at any point along the top edge.

(f) The height of handrails shall be not more than 37 inches (94 cm) nor less than 30 inches (76 cm) from the upper surface of the handrail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(g) When the top edge of a stairrail system also serves as a handrail, the height of the top edge shall be not more than 37 inches (94 cm) nor less than 36 inches (91.5 cm) from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(h) Stairrail systems and handrails shall be so surfaced as to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.

(i) Handrails shall provide an adequate handhold for employees grasping them to avoid falling.

(j) The ends of stairrail systems and handrails shall be constructed so as not to constitute a projection hazard.

(k) Handrails that will not be a permanent part of the structure being built shall have a minimum clearance of 3 inches (8 cm) between the handrail and walls, stairrail systems, and other objects.

(l) Unprotected sides and edges of stairway landings shall be provided with guardrail systems. Guardrail system criteria are contained in chapter 296-155 WAC, Part C-1.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-477, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-477, filed 11/22/91, effective 12/24/91.]

WAC 296-155-480 Ladders. (1) General. The following requirements apply to all ladders as indicated, including job-made ladders.

(a) Ladders shall be capable of supporting the following loads without failure:

(i) Each self-supporting portable ladder: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this section shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction. Ladders built and tested in conformance with the applicable provisions of appendix A of this part will be deemed to meet this requirement.

(ii) Each portable ladder that is not self-supporting: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladders shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this section shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction when the ladder is placed at an angle of 75 1/2 degrees from the horizontal. Ladders built and tested in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

(iii) Each fixed ladder: At least two loads of 250 pounds (114 kg) each, concentrated between any two consecutive attachments (the number and position of additional concentrated loads of 250 pounds (114 kg) each, determined from anticipated usage of the ladder, shall also be included), plus anticipated loads caused by ice buildup, winds, rigging, and impact loads resulting from the use of ladder safety devices. Each step or rung shall be capable of supporting a single concentrated load of at least 250 pounds (114 kg) applied in the middle of the step or rung. Ladders built in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

(b) Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.

(c)(i) Rungs, cleats, and steps of portable ladders (except as provided below) and fixed ladders (including individual-rung/step ladders) shall be spaced not less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, as measured between centerlines of the rungs, cleats, and steps.

(ii) Rungs, cleats, and steps of step stools shall be not less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, as measured between centerlines of the rungs, cleats, and steps.

(iii) Rungs, cleats, and steps of the base section of extension trestle ladders shall be not less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, as measured between centerlines of the rungs, cleats, and steps. The rung spacing on the extension section of the extension trestle ladder shall be not less than 6 inches (15 cm) nor more than

12 inches (31 cm), as measured between centerlines of the rungs, cleats, and steps.

(iv) Cleats on job-made ladders shall be inset into the edges of the side-rails one-half inch, or filler blocks shall be used on the side-rails between the cleats.

(v) Cleats on job-made ladders shall be secured to each rail with three 10d common wire nails or other fasteners of equivalent strength:

(d)(i) The minimum clear distance between the sides of individual-rung/step ladders and the minimum clear distance between the side rails of other fixed ladders shall be 16 inches (41 cm).

(ii) The minimum clear distance between side rails for all portable ladders shall be 11 1/2 inches (29 cm).

(e) The rungs of individual-rung/step ladders shall be shaped such that employees' feet cannot slide off the end of the rungs.

(f)(i) The rungs and steps of fixed metal ladders manufactured after the effective date of this standard, shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

(ii) The rungs and steps of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

(g) Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.

(h) A metal spreader or locking device shall be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.

(i) When splicing is required to obtain a given length of side rail, the resulting side rail must be at least equivalent in strength to a one-piece side rail made of the same material.

(j) Except when portable ladders are used to gain access to fixed ladders (such as those on utility towers, billboards, and other structures where the bottom of the fixed ladder is elevated to limit access), when two or more separate ladders are used to reach an elevated work area, the ladders shall be offset with a platform or landing between the ladders. (The requirements to have guardrail systems with toeboards for falling object and overhead protection on platforms and landings are set forth in chapter 296-155 WAC, Part C-1.)

(k) Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

(l) Wood ladders shall not be coated with any opaque covering, except for identification or warning labels which may be placed on one face only of a side rail.

(m) The minimum perpendicular clearance between fixed ladder rungs, cleats, and steps, and any obstruction behind the ladder shall be 7 inches (18 cm), except in the case of an elevator pit ladder, for which a minimum perpendicular clearance of 4 1/2 inches (11 cm) is required.

(n) The minimum perpendicular clearance between the center line of fixed ladder rungs, cleats, and steps, and any obstruction on the climbing side of the ladder shall be 30 inches (76 cm), except as provided in (o) of this subsection.

(o) When unavoidable obstructions are encountered, the minimum perpendicular clearance between the centerline of fixed ladder rungs, cleats, and steps, and the obstruction on the climbing side of the ladder may be reduced to 24 inches

(61 cm), provided that a deflection device is installed to guide employees around the obstruction.

(p) Through fixed ladders at their point of access/egress shall have a step-across distance of not less than 7 inches (18 cm) nor more than 12 inches (30 cm) as measured from the centerline of the steps or rungs to the nearest edge of the landing area. If the normal step-across distance exceeds 12 inches (30 cm), a landing platform shall be provided to reduce the distance to the specified limit.

(q) Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches (38 cm) on each side of the centerline of the ladder.

(r) Fixed ladders shall be provided with cages, wells, ladder safety devices, or self-retracting lifelines where the length of climb is less than 24 feet (7.3 m) but the top of the ladder is at a distance greater than 24 feet (7.3 m) above lower levels.

(s) Where the total length of a climb equals or exceeds 24 feet (7.3 m), fixed ladders shall be equipped with one of the following:

(i) Ladder safety devices; or

(ii) Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet (45.7 m); or

(iii) A cage or well, and multiple ladder sections, each ladder section not to exceed 50 feet (15.2 m) in length. Ladder sections shall be offset from adjacent sections, and landing platforms shall be provided at maximum intervals of 50 feet (15.2 m).

(t) Cages for fixed ladders shall conform to all of the following:

(i) Horizontal bands shall be fastened to the side rails of rail ladders, or directly to the structure, building, or equipment for individual-rung ladders;

(ii) Vertical bars shall be on the inside of the horizontal bands and shall be fastened to them;

(iii) Cages shall extend not less than 27 inches (68 cm), or more than 30 inches (76 cm) from the centerline of the step or rung (excluding the flare at the bottom of the cage), and shall not be less than 27 inches (68 cm) in width;

(iv) The inside of the cage shall be clear of projections;

(v) Horizontal bands shall be spaced not more than 4 feet (1.2 m) on center vertically;

(vi) Vertical bars shall be spaced at intervals not more than 9 1/2 inches (24 cm) on center horizontally;

(vii) The bottom of the cage shall be at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder. The bottom of the cage shall be flared not less than 4 inches (10 cm) all around within the distance between the bottom horizontal band and the next higher band;

(viii) The top of the cage shall be a minimum of 42 inches (1.1 m) above the top of the platform, or the point of access at the top of the ladder, with provision for access to the platform or other point of access.

(u) Wells for fixed ladders shall conform to all of the following:

(i) They shall completely encircle the ladder;

(ii) They shall be free of projections;

(iii) Their inside face on the climbing side of the ladder shall extend not less than 27 inches (68 cm) nor more than 30 inches (76 cm) from the centerline of the step or rung;

(iv) The inside clear width shall be at least 30 inches (76 cm);

(v) The bottom of the wall on the access side shall start at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder.

(v) Ladder safety devices, and related support systems, for fixed ladders shall conform to all of the following:

(i) They shall be capable of withstanding without failure a drop test consisting of an 18-inch (41 cm) drop of a 500-pound (226 kg) weight;

(ii) They shall permit the employee using the device to ascend or descend without continually having to hold, push or pull any part of the device, leaving both hands free for climbing;

(iii) They shall be activated within 2 feet (.61 m) after a fall occurs, and limit the descending velocity of an employee to 7 feet/sec. (2.1 m/sec.) or less;

(iv) The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed 9 inches (23 cm) in length.

(w) The mounting of ladder safety devices for fixed ladders shall conform to the following:

(i) Mountings for rigid carriers shall be attached at each end of the carrier, with intermediate mountings, as necessary, spaced along the entire length of the carrier, to provide the strength necessary to stop employees' falls.

(ii) Mountings for flexible carriers shall be attached at each end of the carrier. When the system is exposed to wind, cable guides for flexible carriers shall be installed at a minimum spacing of 25 feet (7.6 m) and maximum spacing of 40 feet (12.2 m) along the entire length of the carrier, to prevent wind damage to the system.

(iii) The design and installation of mountings and cable guides shall not reduce the design strength of the ladder.

(x) The side rails of through or side-step fixed ladders shall extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For a parapet ladder, the access level shall be the roof if the parapet is cut to permit passage through the parapet; if the parapet is continuous, the access level shall be the top of the parapet.

(y) For through-fixed-ladder extensions, the steps or rungs shall be omitted from the extension and the extension of the side rails shall be flared to provide not less than 24 inches (61 cm) nor more than 30 inches (76 cm) clearance between side rails. Where ladder safety devices are provided, the maximum clearance between side rails of the extensions shall not exceed 36 inches (91 cm).

(z) For side-step fixed ladders, the side rails and the steps or rungs shall be continuous in the extension.

(aa) Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, shall extend at least 42 inches (1.1 m) above an access level or landing platform either by the continuation of the rung spacings as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the rungs.

(2) Use. The following requirements apply to the use of all ladders, including job-made ladders, except as otherwise indicated:

(a) When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (.9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

(b) Ladders shall be maintained free of oil, grease, and other slipping hazards.

(c) Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity.

(d) Ladders shall be used only for the purpose for which they were designed.

(e)(i) Nonself-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).

(ii) Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.

(iii) Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.

(f) Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.

(g) Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.

(h) Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.

(i) The area around the top and bottom of ladders shall be kept clear.

(j) The top of a nonself-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.

(k) Ladders shall not be moved, shifted, or extended while occupied.

(l) Ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized electrical equipment, except as provided in the following:

(i) Portable metal or other portable conductive ladders shall not be used on or near energized line or equipment except where nonconductive ladders present a greater electrical hazard than conductive ladders. A greater electrical hazard would be static electricity such as might be found in extra high voltage substations.

(ii) All conductive or metal ladders shall be prominently marked and identified as being conductive.

(iii) All conductive or metal ladders shall be grounded when used near energized lines or equipment.

(m) The top or top step of a stepladder shall not be used as a step.

(n) Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.

(o) Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.

(p) Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either be immediately marked in a manner that readily identifies them as defective, or be tagged with "do not use" or similar language, and shall be withdrawn from service until repaired.

(q) Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be withdrawn from service until repaired. The requirement to withdraw a defective ladder from service is satisfied if the ladder is either:

(i) Immediately tagged with "do not use" or similar language;

(ii) Marked in a manner that readily identifies it as defective;

(iii) Or blocked (such as with a plywood attachment that spans several rungs).

(r) Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.

(s) Single-rail ladders shall not be used.

(t) When ascending or descending a ladder, the user shall face the ladder.

(u) Employees shall not ascend or descend ladders while carrying tools or materials that might interfere with the free use of both hands.

(v) When working from a ladder, the ladder shall be secured at both top and bottom.

(w) No type of work shall be performed on a ladder over twenty-five feet from the ground or floor that requires the use of both hands to perform the work, unless a safety belt is worn and the safety lanyard is secured to the ladder.

(x) Any work that requires wearing eye protection, respirators, or handling of pressure equipment shall not be performed from a ladder more than twenty-five feet above the surrounding surface.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-480, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-480, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-480, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-480, filed 1/10/91, effective 2/12/91; 90-09-026 (Order 90-01), § 296-155-480, filed 4/10/90, effective 5/25/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-480, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-480, filed 7/31/79; Order 76-29, § 296-155-480, filed 9/30/76; Order 76-6, § 296-155-480, filed 3/1/76; Order 74-26, § 296-155-480, filed 5/7/74, effective 6/6/74.]

WAC 296-155-485 Scaffolding. (1) General requirements. Scaffolds shall be furnished and erected in accor-

dance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction, except that ladders used for such work shall conform to Part J chapter 296-155 WAC.

(a) All rules for design, construction, maintenance, operation, testing, and use of scaffolds contained in Part J-1 chapter 296-24 WAC apply within the construction industry.

(b) Scaffolds shall be erected in accordance with requirements of this section.

(c) The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks, shall not be used to support scaffolds or planks.

(d) No scaffold shall be erected, moved, dismantled, or altered except under the supervision of competent persons.

(e) Standard guardrails and toeboards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor, except needle beam scaffolds and floats. Scaffolds 4 feet to 10 feet in height, having a minimum horizontal dimension in either direction of less than 45 inches, shall have standard guardrails and toeboards installed on all open sides and ends of the scaffold platform.

(f) Where persons are required to work or pass under the scaffold, scaffolds shall be provided with a screen between the toeboard and the guardrail, extending along the entire opening, consisting of No. 18 gauge U.S. Standard wire 1/2-inch mesh, or the equivalent.

(g) Scaffolds and their components shall be capable of supporting without failure at least 4 times the maximum intended load.

(h) Any scaffold including accessories such as braces, brackets, trusses, screw legs, ladders, etc. damaged or weakened from any cause shall be immediately repaired or replaced.

(i) All load-carrying timber members of scaffold framing shall be a minimum of 1,500 fiber (stress grade) construction grade lumber. All dimensions are nominal sizes as provided in the American Lumber Standards, except that where rough sizes are noted, only rough or undressed lumber of the size specified will satisfy minimum requirements.

(j) All planking shall be scaffold grades, or equivalent, as recognized by approved grading rules for the species of wood used. The maximum permissible spans for 2- x 10-inch or wider planks shall be as shown in Table J-1.

(k) The maximum permissible span for 1 1/4- x 9-inch or wider plank of full thickness shall be 4 feet with medium duty loading of 50 p.s.f.

(l) Platforms shall be level. All planking or platforms shall be overlapped (minimum 12 inches), or secured from movement. The platform shall be a minimum of two 2-inch by 10-inch planks in width or a minimum of 18 inches.

(m) An access ladder or equivalent safe access shall be provided.

(n) Scaffold planks shall extend over their end supports not less than 6 inches nor more than 12 inches.

(o) The poles, legs, or uprights of scaffolds shall be plumb, and securely and rigidly braced to prevent swaying and displacement.

(p) Overhead protection shall be provided for persons on a scaffold exposed to overhead hazards.

(q) Slippery conditions on scaffolds shall be eliminated as soon as possible after they occur.

(r) Welding, burning, riveting, or open flame work shall not be performed on any staging suspended by means of fiber or synthetic rope unless suspended components are well insulated to protect against damaging contacts. Only treated or protected fiber or synthetic ropes shall be used for or near any work involving the use of corrosive substances or chemicals. Specific requirements for boatswain's chairs and float or ship scaffolds are contained in subsections (10) and (21) of this section.

(s) Wire, synthetic, or fiber rope used for scaffold suspension shall be capable of supporting at least 6 times the rated load.

(t) The use of shore or lean-to scaffolds is prohibited.

(u) The height of freestanding scaffold towers shall not exceed four times the minimum base dimension.

(v) Factory-built (laminated) scaffold planks meeting the requirements of wood scaffold planks may be substituted for wood scaffold planks.

(w) Materials being hoisted onto a scaffold shall have a tag line.

(x) Employees shall not work on scaffolds during storms or high winds.

(y) Tools, materials, and debris shall not be allowed to accumulate in quantities to cause a hazard.

(2) Wood pole scaffolds.

(a) Scaffold poles shall bear on a foundation of sufficient size and strength to spread the load from the pole over a sufficient area to prevent settlement. All poles shall be set plumb.

(b) Where wood poles are spliced, the ends shall be squared and the upper section shall rest squarely on the lower section. Wood splice plates shall be provided on at least two adjacent sides and shall be not less than 4 feet in length, overlapping the abutted ends equally, and have the same width and not less than the cross-sectional area of the pole. Splice plates or other materials of equivalent strength may be used.

(c) Independent pole scaffolds shall be set as near to the wall of the building as practicable.

(d) All pole scaffolds shall be securely guyed or tied to the building or structure. Where the height or length exceeds 25 feet, the scaffold shall be secured at intervals not greater than 25 feet vertically and horizontally.

(e) Putlogs or bearers shall be set with their greater dimension vertical, and long enough to project over the ledgers of the inner and outer rows of poles at least 3 inches for proper support.

(f) Every wooden putlog on single pole scaffolds shall be reinforced with a 3/16- x 2-inch steel strip, or equivalent, secured to its lower edge throughout its entire length.

(g) Ledgers shall be long enough to extend over two pole spaces. Ledgers shall not be spliced between the poles. Ledgers shall be reinforced by bearing blocks securely nailed to the side of the pole to form a support for the ledger.

(h) Diagonal bracing shall be provided to prevent the poles from moving in a direction parallel with the wall of the building, or from buckling

(i) Cross bracing shall be provided between the inner and outer sets of poles in independent pole scaffolds. The free ends of pole scaffolds shall be cross braced.

(j) Full diagonal face bracing shall be erected across the entire face of pole scaffolds in both directions. The braces shall be spliced only at the poles. The inner row of poles on medium and heavy duty scaffolds shall be braced in a similar manner.

(k) Platform planks shall be laid with their edges close together so the platform will be tight with no spaces through which tools or fragments of material can fall.

(l) Where planking is lapped, each plank shall lap its end supports at least 12 inches. Where the ends of planks abut each other to form a flush floor, the butt joint shall be at the centerline of a pole. The abutted ends shall rest on separate bearers. Intermediate beams shall be provided where necessary to prevent dislodgment of planks due to deflection, and the ends shall be secured to prevent their dislodgment.

(m) When a scaffold materially changes its direction, the platform planks shall be laid to prevent tipping. The planks that meet the corner putlog at an angle shall be laid first, extending over the diagonally placed putlog far enough to have a good safe bearing, but not far enough to involve any danger from tipping. The planking running in the opposite direction at an angle shall be laid so as to extend over and rest on the first layer of planking.

(n) When moving platforms to the next level, the old platform shall be left undisturbed until the new putlogs or bearers have been set in place, ready to receive the platform planks.

(o) All wood pole scaffolds 60 feet or less in height shall be constructed and erected in accordance with Tables J-2 to J-8. If they are over 60 feet in height, they shall be designed by a qualified engineer competent in this field, and shall be constructed and erected in accordance with such design. Design drawings shall be available at the jobsite.

(3) Tube and coupler scaffolds.

(a) A light duty tube and coupler scaffold shall have all posts, bearers, runners, and bracing of nominal 2-inch O.D. steel tubing. The posts shall be spaced no more than 6 feet apart by 10 feet along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load. No dissimilar metals shall be used together.

(b) A medium duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing. Posts spaced not more than 6 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2 1/2-inch O.D. steel tubing. Posts spaced not more than 5 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2-inch O.D. steel tubing. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be used together.

(c) A heavy duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing, with the posts spaced not more than 6 feet by 6 feet-6 inches. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be used together.

(d) Tube and coupler scaffolds shall be limited in heights and working levels to those permitted in Tables J-8,

J-9 and J-10. Drawings and specifications of all tube and coupler scaffolds above the limitations in Tables J-8, J-9 and J-10 shall be designed by a qualified engineer competent in this field. Design drawings shall be available at the jobsite.

(e) All tube and coupler scaffolds shall be constructed and erected to support four times the maximum intended loads, as set forth in Tables J-8, J-9 and J-10, or as set forth in the specifications by a licensed professional engineer competent in this field.

(f) Posts shall be accurately spaced, erected on suitable bases, and maintained plumb.

(g) Runners shall be erected along the length of the scaffold, located on both the inside and the outside posts at even height. Runners shall be interlocked to the inside and the outside posts at even heights. Runners shall be interlocked to form continuous lengths and coupled to each post. The bottom runners shall be located as close to the base as possible. Runners shall be placed not more than 6 feet-6 inches on centers. When tube and coupler guardrails and midrails are used on outside posts, they may be used in lieu of outside runners.

(h) Bearers shall be installed transversely between posts and shall be securely coupled to the posts with the inboard coupler bearing on the runner coupler. Where guardrails and midrails are required, no outboard runner is required.

(i) The length of the bearer shall exceed the post spacing of the width of the scaffold by the amount necessary to have full contact with the coupler. Bearers used to provide a cantilever support for use as brackets for light and medium-duty scaffolds shall not carry more than two ten-inch planks unless knee braced.

(j) Bracing across the width of the scaffold shall be installed at the ends of the scaffold at least at every fourth level. Such bracing shall extend diagonally from the outer post or runner at this level upward to the inner post or runner at the next level.

(k) Longitudinal diagonal bracing shall be installed on the outer rows of poles at approximately forty degrees to fifty degrees angle from near the base of the first and last outer post upward to the top center of the scaffold. If the scaffold is long, the above diagonal bracing shall be repeated. On short but high runs, the diagonal bracing shall be installed at forty degrees to fifty degrees from the base of the first outer post to the last outer post alternating directions to the top of the scaffold. When conditions preclude the attachment of this bracing to the posts, it may be attached to the runners.

(l) When a scaffold exceeds either 30 feet horizontally or 26 feet vertically, the entire scaffold shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.

(4) Fabricated tubular welded frame scaffolds.

(a) Metal tubular frame scaffolds, including accessories such as braces, brackets, trusses, screw legs, ladders, etc., shall safely support four times the maximum rated load. The maximum rated load shall not be exceeded.

(b) Spacing of panels or frames shall be consistent with the loads imposed.

(c) Scaffolds shall be properly braced by cross bracing or diagonal braces, or both, for securing vertical members together laterally, and the cross braces shall be of such length as will automatically square and aline vertical

members so that the erected scaffold is always plumb, level, square, and rigid. All brace connections shall be made secure.

(d) Panel or frame legs shall be set on adjustable bases or plain bases placed on mud sills or other foundations adequate to support the maximum rated load.

(e) The panels or frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alinement of the legs.

(f) Where uplift may occur, panels shall be locked together vertically by pins or equivalent method.

(g) To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically.

(h) Maximum permissible spans or planking shall be in conformity with (1)(j) of this section.

(i) Fabricated tubular frame scaffolds over 125 feet in height above the base plates shall be designed by a registered professional engineer. Copies of the drawings and specifications shall be available at the jobsite.

(j) Guardrails, midrails, and toeboards shall be installed as required by subsection (1)(e) of this section. Wire mesh shall be provided between the toprail and toeboard when persons are working below.

(k) All fabricated tubular frame scaffolds shall be erected by competent and experienced personnel.

(l) All brackets shall be seated correctly with side brackets parallel to the frames and end brackets at ninety degrees to the frames. Brackets shall not be bent or twisted from normal position. Brackets (except mobile brackets designed to carry materials) are to be used as work platforms only and shall not be used for storage of material or equipment.

(m) Scaffold frames and their components manufactured by different companies shall not be intermixed unless they are compatible and the manufacturer has given written approval. The manufacturer's letter of approval shall be available at the jobsite.

(n) Periodic inspections by the employer shall be made of all fabricated tubular frames and accessories. Any maintenance required shall be made before further use.

(5) Outrigger scaffolds, general.

(a) Outrigger beams shall extend not more than 6 feet beyond the face of the building. The inboard end of outrigger beams, measured from the fulcrum point to the inboard point of support, shall be not less than 1 1/2 times the outboard end in length. The beams shall rest on edge, the sides shall be plumb, and the edges shall be horizontal. The fulcrum point of the beam shall rest on a secure bearing at least 6 inches in each horizontal dimension. The beam shall be secured in place against movement and shall be securely braced at the fulcrum point against tipping.

(b) The inboard ends of outrigger beams shall be positively secured either by means of struts bearing against sills in contact with the overhead beams or ceiling, or by means of tension members secured to the floor joists underfoot, or by both if necessary, or by a securely fastened solid body counterweight. (Water in an open container or loose material in bags shall not be permitted.) The inboard ends of outrigger beams shall be secured against tipping and

the entire supporting structure shall be securely braced in both directions to prevent any horizontal movement.

(c) Unless outrigger scaffolds are designed by a registered professional engineer competent in this field, they shall be constructed and erected in accordance with Table J-11. Outrigger scaffolds, designed by a registered professional engineer, shall be constructed and erected in accordance with such design. A copy of the drawings and specifications shall be available at the jobsite.

(d) Planking shall be laid tight and shall extend to within 3 inches of the building wall. Planking shall be secured to the beams.

(6) Masons' adjustable multiple-point suspension scaffolds.

(a) The scaffold shall be capable of sustaining a working load of 50 pounds per square foot and shall not be loaded in excess of that figure.

(b) The scaffold shall be provided with hoisting machines that meet the requirements of Underwriters' Laboratories, Factory Mutual Engineering Corporation, or other agency or laboratory approved by the department of labor and industries.

(c) The platform shall be supported by wire ropes, capable of supporting at least 6 times the intended load, suspended from overhead outrigger beams.

(d) The scaffold outrigger beams shall consist of structural metal securely fastened or anchored to the frame or floor system of the building or structure.

(e) Each outrigger beam shall be equivalent in strength to at least a standard 7-inch, 15.3-pound steel I-beam, at least 15 feet long, and shall not project more than 6 feet 6 inches beyond the bearing point.

(f) Where the overhang exceeds 6 feet 6 inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed under the supervision of a competent person.

(g) All outrigger beams shall be set and maintained with their webs in a vertical position.

(h) A stop bolt shall be placed at each end of every outrigger beam.

(i) The outrigger beam shall rest on suitable wood bearing blocks.

(j) The free end of the suspension wire ropes shall be equipped with proper size thimbles and secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum. At least four turns of wire rope shall remain on the drum when the platform is at ground level. The use of fiber rope is prohibited.

(k) Where a single outrigger beam is used, the steel shackles or clevises with which the wire ropes are attached to the outrigger beams shall be placed directly over the hoisting drums.

(l) The scaffold platform shall be equivalent in strength to at least 2-inch planking. (For maximum planking spans, see subsection (1)(j) of this section.)

(m) When employees are at work on the scaffold and an overhead hazard exists, overhead protection shall be provided on the scaffold, not more than 9 feet above the platform, consisting of 2-inch planking, or material of equivalent strength, laid tight, and extending not less than the width of the scaffold.

(n) Each scaffold shall be installed or relocated under the supervision of a competent person.

(o) When channel iron outrigger beams are used instead of I-beams, they shall be securely fastened together with the flanges turned out.

(p) All parts of the scaffold, such as bolts, nuts, fittings, clamps, wire rope, outrigger beams and their fastenings shall be maintained in sound condition and shall be inspected before each installation and periodically thereafter. All parts shall be of the grade specified by the manufacturer.

(7) Two-point suspension scaffolds.

(a) Two-point suspension scaffold platforms shall be not less than 20 inches nor more than 36 inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.

(b) The hangers of two-point suspension scaffolds shall be made of wrought iron, mild steel, or other equivalent material, having a cross-sectional area capable of sustaining 4 times the maximum rated load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.

(c) When hoisting machines are used on two-point suspension scaffolds, such machines shall be of a design tested and approved by Underwriters' Laboratories, Factory Mutual Engineering Corporation, or by an agency or laboratory approved by the department of labor and industries.

(d) The roof irons or hooks shall be of mild steel, or other equivalent material, of proper size and design, securely installed and anchored. The roof irons or hooks and any other devices shall have tiebacks of 3/4-inch manila rope, or the equivalent, to serve as a secondary means of anchorage, installed at right angles to the face of the building, whenever possible, and secured to a structurally sound portion of the building.

(e) Two-point suspension scaffolds shall be suspended by wire, synthetic or fiber ropes capable of supporting at least 6 times the rated load. All other components shall be capable of supporting at least four times the rated load.

(f) The sheaves of all blocks, consisting of at least one double and one single block, shall fit the size and type of rope used and shall be a minimum of six inches in diameter.

(g) All wire ropes, fiber and synthetic ropes, slings, hangers, platforms, and other supporting parts shall be inspected before every installation. Periodic inspections shall be made while the scaffold is in use.

(h) On suspension scaffolds designed for a working load of 500 pounds, no more than two persons shall be permitted to work at one time. On suspension scaffolds with a working load of 750 pounds, no more than three persons shall be permitted to work at one time. On suspension scaffolds with a working load of 1,000 pounds, no more than four persons shall be permitted to work at one time. Each employee shall be protected by an approved full body harness attached to a dropline. The droplines shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the employee in case of a fall. In order to keep the dropline continuously attached, with a minimum of slack, to a fixed structure, the attachment point of the dropline shall be appropriately changed as the work progresses.

(i) When a multi-tiered two-point suspension scaffold is used, it shall be provided with safety droplines that attach to each end of the scaffold through an approved quick acting

safety device, in case either or both of the main suspension lines should break. The lanyard of the full body harness shall be tied off to a substantial member of the scaffold itself or to a horizontal lifeline attached to each end of the scaffold or a sliding device on the horizontal lifeline. The two additional safety droplines shall be individually suspended from roof irons, hooks, or other approved devices and shall be near the suspension droplines to prevent unnecessary side impact. The safety dropline shall have a 6 to 1 safety factor. Such scaffolds shall be designed by a licensed professional engineer and a copy of the drawings and specifications shall be available at the jobsite.

(j) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent the scaffolds from swaying. Window cleaners' anchors shall not be used for this purpose.

(k) The platform of every two-point suspension scaffold shall be one of the following types:

(i) Ladder-type platforms. The side stringer shall be of clear straight-grained spruce or materials of equivalent strength and durability. The rungs shall be of straight-grained oak, ash, or hickory, at least 1 1/8 inch in diameter, with 7/8-inch tenons mortised into the side stringers at least 7/8-inch. The stringers shall be tied together with the tie rods not less than one-quarter inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than five-eighths inch apart except at the side rails where the space may be 1 inch. Ladder-type platforms shall be constructed in accordance with Table J-12.

(ii) Plank-type platforms. Plank-type platforms shall be composed of not less than two nominal 2- x 10-inch unspliced planks, properly cleated together on the underside, starting 6 inches from each end; intervals in between shall not exceed 4 feet. The plank-type platform shall not extend beyond the hangers more than 12 inches. A bar or other effective means shall be securely fastened to the platform at each end to prevent its slipping off the hanger. The span between hangers for plank-type platforms shall not exceed 8 feet.

(iii) Beam-type platforms. Beam platforms shall have side stringers of lumber not less than 2 x 6 inches set on edge. The span between hangers shall not exceed 12 feet when beam platforms are used. The flooring shall be supported on 2- x 6-inch cross beams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than 4 feet, securely nailed in place. The flooring shall be of 1- x 6-inch material properly nailed. Floor boards shall not be spaced more than one-half inch apart.

(iv) Light metal-type platforms, when used, shall be tested and listed according to Underwriters' Laboratories, Factory Mutual Engineering Corporation, or the department of labor and industries.

(l) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(m) When acid solutions are used, natural or synthetic fiber rope shall not be used.

(n) Every swinging scaffold shall be tested before using by raising the platform one foot from the ground and loading it with at least four times the maximum weight to be imposed when aloft.

(8) Stone setters' adjustable multiple-point suspension scaffolds.

(a) The scaffold shall be capable of sustaining a working load of 25 pounds per square foot and shall not be overloaded. Scaffolds shall not be used for storage of stone or other heavy materials.

(b) When used, the hoisting machine and its supports shall be of a type tested and listed by Underwriters' Laboratories, Factory Mutual Engineering Corporation or the department of labor and industries.

(c) The platform shall be securely fastened to the hangers by U-bolts or other equivalent means. (For materials and spans, see item (ii) of subsection (7)(k), Plank-type Platforms and Table J-12 of this section.)

(d) The scaffold unit shall be suspended from metal outriggers, iron brackets, wire rope slings, or iron hooks.

(e) Outriggers, when used, shall be set with their webs in a vertical position, securely anchored to the building or structure and provided with stop bolts at each end.

(f) The scaffold shall be supported by wire rope capable of supporting at least 6 times the rated load. All other components shall be capable of supporting at least 4 times the rated load.

(g) The free ends of the suspension wire ropes shall be equipped with proper size thimbles, secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of wire rope shall remain on the drum at all times.

(h) When two or more scaffolds are used on a building or structure, they shall not be bridged one to the other; but shall be maintained at even height with platforms abutting closely.

(i) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(j) Each scaffold shall be installed or relocated in accordance with approved designs and instructions under the supervision of a competent designated person.

(k) Where additional working levels are required to be supported, the plans and specifications of the support and scaffold components shall be designed by a licensed professional engineer. These plans and specifications shall be available at the site.

(9) Single-point adjustable suspension scaffolds.

(a) The scaffolding, including power units or manually operated winches, shall be of a type tested and listed by Underwriters' Laboratories, Factory Mutual Engineering Corporation or the department of labor and industries.

(b) The power units may be either electrically or air motor driven.

(c) All power-operated gears and brakes shall be enclosed.

(d) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(e) The hoisting machines, cables, and equipment shall be regularly serviced and inspected.

(f) The units may be combined to form a two-point suspension scaffold. Such scaffold shall comply with subsection (7) of this section.

(g) When the supporting wire rope is not plumb for its entire length, supports shall be designed to sustain any additional load or stress upon the line.

(h) Suspension methods and employee safeguards shall conform to the provisions of subsections (6) and (7) of this section.

(i) For additional details not covered in this subsection applicable technical portions of American National Standards Institute, A120.1-1970, Power-Operated Devices for Exterior Building Maintenance Powered Platforms, shall be used.

(10) Boatswain's chairs.

(a) The chair seat shall not be less than 12 x 24 inches, and 1-inch thick. The seat shall be reinforced on the underside by cleats securely fastened to prevent the board from splitting. Specially designed seats having dimensions other than those specified in this subsection may be used provided they have been designed and tested (with a safety factor of four) to sustain a load of two hundred fifty pounds.

(b) The two fiber rope seat slings shall be of 5/8-inch diameter, reeved through the four seat holes so as to cross each other on the underside of the seat.

(c) Seat slings shall be of at least 3/8-inch wire rope when an employee is conducting a heat-producing process, such as gas welding.

(d) The employee shall be protected by a full body harness and lifeline in accordance with chapter 296-155 WAC, Part C-1. The attachment point of the lifeline to the structure shall be appropriately changed as the work progresses.

(e) The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced 5/8-inch diameter first grade manila rope, or equivalent.

(f) The roof irons, hooks, or the object to which the tackle is anchored, shall be securely installed. Tiebacks, when used, shall be installed at right angles to the face of the building and securely fastened.

(g) The scaffolding, including power units shall be of tested design.

(h) All power operated gears and brakes shall be enclosed.

(i) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(11) Carpenters' bracket scaffolds.

(a) The brackets shall consist of a triangular wood frame not less than 2 x 3 inches in cross section, or of metal of equivalent strength. Each member shall be properly fitted and securely joined.

(b) Each bracket shall be attached to the structure by means of one of the following:

(i) A bolt, no less than 5/8-inch in diameter, which shall extend through to the inside of the building wall;

(ii) A metal stud attachment device;

(iii) Welding to steel tanks;

(iv) Hooking over a well-secured and adequately strong supporting member.

(c) The brackets shall be spaced no more than 8 feet apart.

(d) No more than two employees shall occupy any given 8 feet of a bracket scaffold at any one time. Tools and

materials shall not exceed 75 pounds in addition to the occupancy.

(e) The platform shall consist of not less than two 2- x 10-inch planks extending not more than 12 inches or less than 6 inches beyond each end support. Fabricated planking may be used if properly engineered and tested.

(12) Bricklayers' square scaffolds.

(a) The squares shall not exceed 5 feet in width and 5 feet in height.

(b) Members shall be not less than those specified in Table J-13.

(c) The squares shall be reinforced on both sides of each corner with 1- x 6-inch gusset pieces. They shall also have diagonal braces 1 x 8 inches on both sides running from center to center of each member, or other means to secure equivalent strength and rigidity.

(d) The squares shall be set not more than 5 feet apart for medium duty scaffolds, and not more than 8 feet apart for light duty scaffolds. Bracing, 1 x 8 inches, extending from the bottom of each square to the top of the next square, shall be provided on both front and rear sides of the scaffold.

(e) Platform planks shall be at least 2 x 10-inch. The ends of the planks shall overlap the bearers of the squares and each plank shall be supported by not less than three squares. Fabricated planking may be used if properly engineered and tested.

(f) Bricklayers' square scaffolds shall not exceed three tiers in height and shall be so constructed and arranged that one square shall rest directly above the other. The upper tiers shall stand on a continuous row of planks laid across the next lower tier and be nailed down or otherwise secured to prevent displacement.

(g) Scaffolds shall be level and set upon a firm foundation.

(13) Horse scaffolds.

(a) Horse scaffolds shall not be constructed or arranged more than two tiers or 10 feet in height.

(b) The members of the horses shall be not less than those specified in Table J-14.

(c) Horses shall be spaced not more than 5 feet for medium duty and not more than 8 feet for light duty.

(d) When arranged in tiers, each horse shall be placed directly over the horse in the tier below.

(e) On all scaffolds arranged in tiers, the legs shall be nailed down or otherwise secured to the planks to prevent displacement or thrust and each tier shall be substantially cross braced.

(f) Horses or parts which have become weak or defective shall not be used.

(14) Needle beam scaffold.

(a) Wood needle beams shall be not less than 4 x 6 inches in size, with the greater dimension placed in a vertical direction. Metal beams or the equivalent, conforming to subsections (1)(h) and (j) of this section, may be used and shall not be altered or moved horizontally while they are in use.

(b) Ropes or hangers shall be provided for supports. The span between supports on the needle beam shall not exceed 10 feet for 4- x 6-inch timbers. Rope supports shall be equivalent in strength to 1-inch diameter first-grade manila rope.

(c) The ropes shall be attached to the needle beams by a scaffold hitch or a properly made eye splice. The loose end of the rope shall be tied by a bowline knot or by a round turn and a half hitch.

(d) The scaffold hitch shall be arranged so as to prevent the needle beam from rolling or becoming otherwise displaced.

(e) The platform span between the needle beams shall not exceed 8 feet when using 2-inch scaffold plank. For spans greater than 8 feet, platforms shall be designed based on design requirements for the special span. The overhang of each end of the platform planks shall be not less than 6 inches and not more than 12 inches.

(f) When needle beam scaffolds are used, the planks shall be secured against slipping.

(g) All unattached tools, bolts, and nuts used on needle beam scaffolds shall be kept in suitable containers, properly secured.

(h) One end of a needle beam scaffold may be supported by a permanent structural member conforming to subsections (1)(h) and (j) of this section.

(i) Each employee working on a needle beam scaffold shall be protected by a full body harness and lifeline in accordance with chapter 296-155 WAC, Part C-1.

(15) Plasterers', decorators', and large area scaffolds.

(a) Plasters', lathers', and ceiling workers' inside scaffolds shall be constructed in accordance with the general requirements set forth for independent wood pole scaffolds. (See subsection (2) of this section and Tables J-5, J-6 and J-7.)

(b) All platform planks shall be laid with the edges close together.

(c) When independent pole scaffold platforms are erected in sections, such sections shall be provided with connecting runways equipped with substantial guardrails.

(16) Interior hung scaffolds.

(a) An interior hung scaffold shall be hung or suspended from the roof structure or ceiling beams.

(b) The suspending wire or fiber rope shall be capable of supporting at least 6 times the rated load. The rope shall be wrapped at least twice around the supporting members and twice around the bearers of the scaffold, with each end of the wire rope secured by at least three standard wire-rope clips properly installed.

(c) For hanging wood scaffolds, the following minimum nominal size material shall be used:

(i) Supporting bearers 2 x 10 inches on edge;

(ii) Planking 2 x 10 inches, with maximum span 7 feet for heavy duty and 10 feet for light duty or medium duty.

(d) Steel tube and coupler members may be used for hanging scaffolds with both types of scaffold designed to sustain a uniform distributed working load up to heavy duty scaffold loads with a safety factor of four.

(e) All overhead supporting members shall be inspected and have required strength assured before the scaffold is erected.

(17) Ladder jack scaffolds.

(a) All ladder jack scaffolds shall be limited to light duty and shall not exceed a height of 20 feet above the floor or ground.

(b) All ladders used in connection with ladder jack scaffolds shall be Type I heavy-duty ladders and shall be

designed and constructed in accordance with American National Standards Institute A14.1-1982, Safety Code for Portable Wood Ladders, and A14.2-1982, Safety Code for Portable Metal Ladders. Cleated ladders shall not be used for this purpose.

(c) The ladder jack shall be so designed and constructed that it will bear on the side rails in addition to the ladder rungs, or if bearing on rungs only, the bearing area shall be at least 10 inches on each rung.

(d) Ladders used in conjunction with ladder jacks shall be so placed, fastened, held, or equipped with devices so as to prevent slipping.

(e) The wood platform planks shall be not less than 2 inches in thickness. Both metal and wood platform planks shall overlap the bearing surface not less than 12 inches and shall be secured to prevent movement. The span between supports for wood shall not exceed 8 feet. Platform width shall be not less than 18 inches.

(f) No more than two persons shall be within any 8 feet section of any ladder jack scaffold at any one time. When the use of standard guardrails as required by subsection (1)(e) of this section is impractical, full body harnesses and lifelines shall be used in accordance with chapter 296-155 WAC, Part C-1.

(18) Window jack scaffolds.

(a) Window jack scaffolds shall be used only for the purpose of working at the window opening through which the jack is placed.

(b) Window jacks shall not be used to support planks placed between one window jack and another or for other elements of scaffolding.

(c) Window jack scaffolds shall be provided with guardrails unless full body harnesses with lifelines are attached and used by the employee.

(d) Not more than one employee shall occupy a window jack scaffold at any one time.

(e) Window jacks shall be designed and constructed so as to provide a secure anchorage on the window opening and be capable of supporting the design load.

(19) Roofing brackets.

(a) Roofing brackets shall be constructed to fit the pitch of the roof.

(b) Brackets shall be secured in place by nailing in addition to the pointed metal projections. When it is impractical to nail brackets, rope supports shall be used. When rope supports are used, they shall consist of first-grade manilla of at least 3/4-inch diameter, or equivalent.

(c) Catch platforms.

(i) A catch platform shall be installed within 10 vertical feet of the work area.

(ii) The catch platforms width shall equal the distance of the fall but shall be a minimum of 45 inches wide and shall be equipped with standard guardrails on all open sides.

(20) Crawling boards or chicken ladders.

(a) Crawling boards shall be not less than 10 inches wide and 1 inch thick, having cleats 1 x 1 1/2 inches. The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed 24 inches. Nails shall be driven through and clinched on the underside. The crawling board shall extend from the ridge pole to the eaves

when used in connection with roof construction, repair, or maintenance.

(b) A firmly fastened lifeline of at least 3/4-inch diameter rope, or equivalent, shall be strung beside each crawling board for a handhold.

(c) Crawling boards shall be secured to the roof by means of adequate ridge hooks or other effective means.

(21) Float or ship scaffolds.

(a) Float or ship scaffolds shall not be used to support more than three persons and a few light tools, such as those needed for riveting, bolting, and welding. They shall be constructed as designed in subdivisions (b) through (f) of this subsection, unless substitute designs and materials provide equivalent strength, stability, and safety.

(b) The platform shall be not less than 3 feet wide and 6 feet long, made of 3/4-inch plywood, equivalent to American Plywood Association Grade B-B, Group I, Exterior, or other similar material.

(c) Under the platform, there shall be two supporting bearers made from 2- x 4-inch, or 1- x 10-inch rough, "selected lumber," or better. They shall be free of knots or other flaws and project 6 inches beyond the platform on both sides. The ends of the platform shall extend 6 inches beyond the outer edges of the bearers. Each bearer shall be securely fastened to the platform.

(d) An edging of wood not less than 3/4 x 1 1/2 inches or equivalent shall be placed around all sides of the platform to prevent tools from rolling off.

(e) Supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws, or other imperfections and shall be well insulated to protect against damaging contacts of arcs, flames, or other mechanical objects. Rope connections shall be such that the platform cannot shift or slip. If two ropes are used with each float, they shall be arranged so as to provide four ends which are to be securely fastened to an overhead support. Each of the two supporting ropes shall be hitched around one end of bearer and pass under the platforms to the other end of the bearer where it is hitched again, leaving sufficient rope at each end for the supporting ties.

(f) Each employee shall be protected by an approved safety lifebelt or harness and lifeline, in accordance with chapter 296-155 WAC, Part C-1.

(22) Form scaffolds.

(a) Form scaffolds shall be constructed of wood or other suitable materials, such as steel or aluminum members of known strength characteristics. All scaffolds shall be designed and erected with a minimum safety factor of 4, computed on the basis of the maximum rated load.

(b) All scaffold planking shall be a minimum of 2- x 10-inch nominal scaffold grade, as recognized by approved grading rules for the species of lumber used, or equivalent material. Maximum permissible spans shall not exceed 8 feet on centers for 2- x 10-inch nominal planking. Scaffold planks shall be either nailed or bolted to the ledgers or of such length that they overlap the ledgers at least 6 inches. Unsupported projecting ends of scaffolding planks shall be limited to a maximum overhang of 12 inches.

(c) Scaffolds shall not be loaded in excess of the working load for which they were designed.

(d) Figure-four form scaffolds:

(i) Figure-four scaffolds are intended for light duty and shall not be used to support loads exceeding 25 pounds per square foot unless specifically designed for heavier loading. For minimum design criteria, see Table J-15.

(ii) Figure-four form scaffold frames shall be spaced not more than 8 feet on centers and constructed from sound lumber, as follows: The outrigger ledger shall consist of two pieces of 1- x 6-inch or heavier material nailed on opposite sides of the vertical form support. Ledgers shall project not more than 3 feet 6 inches from the outside of the form support and shall be substantially braced and secured to prevent tipping or turning. The knee or angle brace shall intersect the ledger at least 3 feet from the form at an angle of approximately 45°, and the lower end shall be nailed to a vertical support. The platform shall consist of two or more 2- x 10-inch planks, which shall be of such length that they extend at least 6 inches beyond ledgers at each end unless secured to the ledgers. When planks are secured to the ledgers (nailed or bolted), a wood filler strip shall be used between the ledgers. Unsupported projecting ends of planks shall be limited to an overhang of 12 inches.

(e) Metal bracket form scaffolds:

(i) Metal brackets or scaffold jacks which are an integral part of the form shall be securely bolted or welded to the form. Folding type brackets shall be either bolted or secured with a locking-type pin when extended for use.

(ii) "Clip-on" or "hook-over" brackets may be used, provided the form walers are bolted to the form or secured by snap ties or shea-bolt extending through the form and securely anchored.

(iii) Metal brackets shall be spaced not more than 8 feet on centers.

(iv) Scaffold planks shall be either bolted to the metal brackets or of such length that they overlap the brackets at each end by at least 6 inches. Unsupported projecting ends of scaffold planks shall be limited to a maximum overhang of 12 inches.

(v) Metal bracket form scaffolds shall be equipped with wood guardrails, intermediate rails, toeboards, and scaffold planks meeting the minimum dimensions shown in Table J-16. (Metal may be substituted for wood, providing it affords equivalent or greater design strength.)

(f) Wooden bracket form scaffolds:

(i) Wooden bracket form scaffolds shall be an integral part of the form panel. The minimum design criteria set forth herein and in Table J-17 cover scaffolding intended for light duty and shall not be used to support loads exceeding 25 pounds per square foot, unless specifically designed for heavier loading.

(ii) Scaffold planks shall be either nailed or bolted to the ledgers or of such length that they overlap the ledgers at each end by at least 6 inches. Unsupported projecting ends of scaffold planks shall be limited to a maximum overhang of 12 inches.

(23) Pump jack scaffolds.

(a) Pump jack scaffolds shall:

(i) Not carry a working load exceeding 500 pounds;

(ii) Be capable of supporting without failure at least four times the maximum intended load; and

(iii) Shall not have components loaded in excess of the manufacturer's recommended limits.

(b) Pump jack brackets, braces, and accessories shall be fabricated from metal plates and angles. Each pump jack bracket shall have two positive gripping mechanisms to prevent any failure or slippage.

(c) The platform bracket shall be fully docked and the planking secured. Planking, or equivalent, shall conform with subsection (1) of this section.

(d)(i) When wood scaffold planks are used as platforms, poles used for pump jacks shall not be spaced more than 10 feet center to center. When fabricated platforms are used that fully comply with all other provisions of this subsection, pole spacing may exceed 10 feet center to center.

(ii) Poles shall not exceed 30 feet in height.

(iii) Poles shall be secured to the work wall by rigid triangular bracing, or equivalent, at the bottom, top, and other points as necessary, to provide a maximum vertical spacing of not more than 10 feet between braces. Each brace shall be capable of supporting a minimum of 225 pounds tension or compression.

(iv) For the pump jack bracket to pass bracing already installed, an extra brace shall be used approximately 4 feet above the one to be passed until the original brace is reinstalled.

(e) All poles shall bear on mud sills or other adequate firm foundations.

(f) Pole lumber shall be two 2 x 4's, of Douglas fir or equivalent, straight-grained, clear, free of cross-grain, shakes, large loose or dead knots, and other defects which might impair strength.

(g) When poles are constructed of two continuous lengths, they shall be two by fours, spiked together with the seam parallel to the bracket, and with 10d common nails, no more than 12 inches center to center, staggered uniformly from opposite outside edges.

(h) If two by fours are spliced to make up the pole, the splices shall be so constructed as to develop the full strength of the member. Three-eighths inch or one-half inch exterior grade plywood shall be used for a spacer between the two by fours. The joints for the splices shall be staggered on opposite sides of the pole at least four feet apart. Joints shall be no less than four feet from either end of the pole.

(i) A ladder, in accordance with WAC 296-155-480, shall be provided for access to the platform during use.

(j) Not more than two persons shall be permitted at one time upon a pump jack scaffold between any two supports.

(k) Pump jack scaffolds shall be provided with standard guardrails, unless full body harnesses with lifelines are used by employees.

(l) When a work bench is used at an approximate height of 42 inches, the top guardrail may be eliminated, if the work bench is fully decked, the planking secured, and is capable of withstanding 200 pounds pressure in any direction.

(m) Employees shall not be permitted to use a work bench as a scaffold platform.

(24) Factory-built scaffold units. Factory-built or prefabricated scaffold units intended for assembly on the job, prefabricated plank, staging, etc., mechanical hoisting units, or other devices for use on or in connection with any type scaffolds, shall be approved by an agency or laboratory approved by the department before being used.

(25) Waler bracket scaffolds.

(a) Waler brackets shall be constructed of 1 5/8" x 1 1/2" x 3/16" angle iron minimum size, or material of equivalent strength.

(b) All steel connections shall be welded and riveted or bolted, except where detrimental to strength of materials.

(c) The maximum length of horizontal leg shall not be more than 36" between bracket hook and railing standard.

(d) A 4" x 4" x 3/16" gusset plate shall be securely welded at inside of leg angle.

(e) Nailing holes shall be provided in lower end of vertical leg for purpose of securing bracket against lifting or shifting.

(f) Waler hook or hooks shall be a minimum of 4-inch depth and be constructed of material of a strength to support a minimum of 400 pounds at extreme outer end of bracket.

(26) Chimney, stack and tank bracket scaffolds.

(a) General. A chimney, stack or tank bracket scaffold shall be composed of a platform supported by brackets which are hooked over a steel cable which surrounds the circumference of the chimney, stack or tank approximately in a horizontal plane. The platform shall be not less than two 2 x 10 inch planks. For a minimum width of eighteen inches wide and be designed with a safety factor of not less than 4.

(b) All brackets shall have a mild steel suspension hook 2 inches by 1/4-inch with at least 3 inches projecting beyond the throat of the hook. Hooks shall be integral with or securely attached to the bracket.

(c) Wood spacer blocks shall be provided to hold the suspending cable away from the structure at the points where brackets are hooked on. These spacer blocks shall be not less than 2 inches by 4 inches by 12 inches.

(d) All suspending cables shall be improved plow steel 6 x 19 wire rope or equivalent. In no case shall less than 1/2-inch diameter wire rope be used.

(e) The turnbuckle used to tighten suspending cables shall be not less than 1 inch drop forged steel. The cables shall be provided with thimbles and not less than 3 U-bolt type clips at each end and be attached to the turnbuckles by means of shackles. Open hooks shall not be used.

(f) All chimney, stack and tank bracket scaffolds shall be provided with standard guard rails, intermediate rails and toeboards.

(g) For access to a chimney, stack or tank bracket scaffold, ladders or a boatswain's chair shall be used.

(h) All chimney, stack or tank brackets for scaffolds shall be welded and riveted or bolted.

(27) Scaffold platforms supported by catenary or stretch cables.

(a) When a scaffold platform is supported by cables at least 4 cables shall be used, two near each end of the scaffold.

(b) The cables shall be attached to the scaffold by means of U-bolts or the equivalent through which the cables pass.

(c) Cables shall not be tightened beyond their safe working load. A hanger or set of falls shall be used approximately every 50 feet to pick up the sag in the cable.

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1/10/91, effective 2/12/91; 90-03-029 (Order 89-20), § 296-155-485, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-485, filed 1/21/86; 82-08-026 (Order 82-10), § 296-155-485, filed 3/30/82. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-485, filed 7/31/79; Order 76-29, § 296-155-485, filed 9/30/76; Order 76-6, § 296-155-485, filed 3/1/76; Order 74-26, § 296-155-485, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48531 Vehicle mounted elevating and rotating aerial devices. (1) All applicable rules for design, construction, maintenance, operation, testing, and use of vehicle mounted elevating and rotating aerial devices shall be in conformance with American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969 and as amended through ANSI A92.2-1979.

(2) Application:

(a) Aerial lifts acquired before February 21, 1986, which do not meet the requirements of ANSI A92.2-1979, may not be used unless they have been modified so as to conform with the applicable design and construction requirements of ANSI A92.2-1969.

(b) Aerial devices include the following:

- (i) Extensible boom platforms;
- (ii) Aerial ladders;
- (iii) Articulating boom platforms;
- (iv) Vertical towers; and
- (v) A combination of any of the above.

(3) Specification display. The aerial device shall have manufacturer's statement clearly stating the minimum values for the following characteristics of vehicles required to provide a stable and structurally sound carrier for the aerial device:

- (a) The front gross axle weight rating (GAWR front).
- (b) The rear gross axle weight rating (GAWR rear).
- (c) The gross vehicle weight rating (GVWR).
- (d) The frame section modulus.
- (e) The yield strength of the vehicle frame.
- (f) The frame resisting bending moment (RBM).
- (g) The wheelbase dimension (WB).
- (h) The rear of cab to rear axle centerline dimension (CA).

(4) Data display: The following information shall be clearly stated in the manufacturer's manual and on the aerial device.

- (a) Make and model.
- (b) Rated load capacity.
- (c) Aerial device height and reach.
- (d) Maximum pressure of the hydraulic system and voltage of the electrical system.
- (e) Cautions and restrictions of operations.

(5) Types of rated load: Rated load capacity is of two distinct types:

(a) The platform load consisting of the weight of personnel and all items carried on or in the platform.

(b) Supplemental loads which may be fixed directly to the boom(s), or to load-carrying attachments on the aerial device.

(i) The capacity rating in either case shall be designated with boom or booms extended to the position of maximum overturning moment attainable throughout full rotation of the pedestal.

(ii) Capacities of the aerial device in other positions shall be specified separately.

(iii) The manual and placards affixed to the aerial device shall state all applicable capacity ratings.

(6) Multiple configuration rated load. If the aerial device is specified in multiple configurations, these configurations shall be clearly described including the rated load capacity of each, in the manufacturer's manual and on the aerial device. Examples of alternate configurations are:

(a) With outriggers extended to firm footing versus outriggers not extended.

(b) With chassis suspension locking device engaged versus disengaged.

(c) With one platform versus more than one platform.

(d) Used as a personnel-carrying device only versus used as a personnel-carrying and material-handling device.

(e) With extensible aerial device retracted or extended.

(f) With digger attached to boom versus with digger removed from boom. If the rated load capacity of the alternate configuration is related to an angle which a boom(s) makes with the horizontal, the manufacturer shall install a means by which the angle of the boom(s) can be determined.

(7) Maximum elevation determination: Height shall be determined at maximum elevation, from the floor of the platform to the ground, with the aerial device assumed to be mounted on a vehicle having a chassis frame height of thirty-six inches.

(8) Maximum reach determination: Reach, as a maximum, shall be measured in the horizontal plane, from the centerline of rotation to the outer edge (rail) of the platform.

(9) Insulated aerial devices.

(a) The aerial device manufacturer's manual and instruction plate(s) shall clearly state whether the aerial device is insulated or noninsulated.

(b) In the case of insulated aerial devices.

(i) The manual and instruction plate(s) shall clearly state the qualification voltage for which the aerial device has been satisfactorily tested in accordance with this standard.

(ii) The manual and instruction plate(s) shall clearly state the design voltage for which the aerial device can be tested.

(iii) All components bridging the insulated portions of the aerial device shall have electrical insulating values consistent with the design voltage rating of the upper boom, and, when provided, of the lower insulator.

(iv) Test electrodes on articulating-boom aerial devices rated over 69 kV, and optionally at 69 kV, shall be installed permanently on the inside and outside surfaces of the insulated portion of the upper boom for the purposes of monitoring electrical leakage current.

(v) The test electrodes shall be two to six inches from the metal portion of the lower end of the insulated upper boom.

(vi) All hydraulic and pneumatic lines bridging the insulated portion of the upper boom shall have metallic couplings which connect the inside and outside of any hose and shall be adjacent to the insulated boom test electrodes.

(vii) The test electrode on the outside surface of the insulated boom on extensible-boom aerial devices shall be removable.

(viii) The location of the removable test electrode shall be permanently marked or recorded to facilitate repeating future tests of the apparatus.

(10) Quality control. The design and manufacture of the aerial device shall comply with the principles outlined in this subsection. The manufacture of the aerial device shall include a quality control system which will ensure compliance with ANSI A92.2-1979 and this standard. The drawings and manual shall specify those welds that are considered critical and that must conform to the following standards:

(a) Structural Welding Code, AWS D1.1-1979.

(b) Specifications for Welding Industrial and Mill Cranes, AWS D14.1-1970.

(c) Standards for Qualifications of Welding Procedures and Welders for Piping and Tubing, AWS D10.9-1969.

(i) The manufacture and installation of aerial devices shall include applicable welding quality control procedures for all weldments.

(ii) Methods of nondestructive testing shall be described in the quality control procedures.

(iii) The quality control procedures shall designate the welds to be examined, the extent of examination, and the method of testing.

(iv) Appropriate inspection methods of welds are recommended by the American Welding Society.

(v) The structural load-supporting elements of the aerial device which support the platform, and which are made of a ductile material, shall have a design stress of not more than fifty percent of the minimum yield strength of the material, based on the combined rated load and weight of the support structure.

(vi) The structural load-supporting elements of the aerial device which support the platform, and which are made of a nonductile material, shall have a design stress of not more than twenty percent of the minimum ultimate strength of the material, based on the combined rated load and weight of the support structure.

(vii) The same structural safety factors stated above shall also apply to the platform.

(11) Aerial lift specification. Articulating-boom and extensible-boom aerial devices primarily designed as personnel carriers shall have both upper and lower controls.

(a) Upper controls shall be in or beside the platform, readily visible and available within easy reach of the operator, and protected from damage and inadvertent actuation.

(b) Lower controls shall be easily accessible and shall provide for overriding the upper controls. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

(c) These and all other controls shall be plainly identified as to their function.

(d) The controls shall return to their neutral position when released by the operator.

(e) Vehicle-mounted articulating and telescoping cranes or derricks equipped with accessory platforms need not have controls at the platform station.

(f) Aerial ladders that are designed and manufactured with upper controls shall comply with the requirements of this subsection.

(g) Mechanical ladders that are counterbalanced for ease in raising to, and lowering from, an operating position shall be equipped with a locking device to secure the ladder in the lower traveling position.

(h) Each aerial device, when mounted on a vehicle meeting the manufacturer's minimum vehicle specifications, and used in a specific configuration, shall comprise a mobile unit capable of sustaining a static load one and one-half times its rated load capacity, in every position in which the load can be placed within the definition of the specific configuration, when the vehicle is on a firm and level surface. If having the outriggers extended to a firm footing is part of the definition of the configuration, they shall be extended to provide leveling for the purpose of determining whether the mobile unit meets the stability requirements.

(i) Each aerial device, when mounted on a vehicle meeting the manufacturer's minimum vehicle specifications, and used in a specific configuration, shall comprise a mobile unit capable of sustaining a static load one and one-third times its rated load capacity in every position in which the load can be placed within the definition of the specific configuration when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning. If having the outriggers extended to a firm footing is part of the definition of the configuration, they shall be extended to provide leveling for the purpose of determining whether the mobile unit meets the stability requirements.

(j) If other facilities, such as a means of turntable leveling, are provided to minimize the effect of the sloping surface, then those facilities shall be utilized for the purpose of determining whether the mobile unit meets the stability requirements.

(k) Vertical towers designed specifically for operation only on a level surface shall be excluded from this requirement.

(l) None of the stability tests described in this subsection shall produce instability of the mobile unit as defined herein or cause permanent deformation of any component.

(m) The lifting of a tire or outrigger on the opposite side of the load does not necessarily indicate a condition of instability.

(12) Hydraulic components.

(a) All hydraulic components whose failure could result in free and unrestricted motion of the boom(s) shall have a minimum bursting strength of at least four times the operating pressure for which the system is designed.

(b) All hydraulic components normally rated according to bursting strength, such as hose, tubing, and fittings, shall have a minimum bursting strength of at least three times the operating pressure for which the system is designed.

(c) All hydraulic components normally rated according to performance criteria, such as rated flow and pressure, life cycles, pressure drop, rpm, torque, and speed, shall have a minimum bursting strength of at least two times the operating pressure for which the system is designed. Such components generally include pumps, motors, directional controls, and similar functional components.

(13) Power failure.

(a) Where the operation of the aerial device is accomplished by hydraulic means, the system shall be equipped with appropriate devices to prevent free and unrestricted

motion of the aerial device in the event of hydraulic line failure.

(b) Where the operation of the aerial device is accomplished electrically, the system shall be designed to prevent free and unrestricted motion in the event of generator or power failure.

(c) This protection shall also apply to components used to stabilize a mobile unit where a system failure would result in instability.

(14) Platforms.

(a) Platform walls shall be approximately forty-two inches plus or minus three inches high when buckets or baskets are used as platforms, or the platforms shall be provided with a rail or other device around the periphery that also shall be approximately forty-two inches plus or minus three inches above the floor with a midrail and a kick plate that is at least four inches high, or its equivalent.

(b) A means shall be provided that allows personnel to attach a safety strap or lanyard to the platform or boom.

(c) Steps of all platforms shall be provided with nonskid surfaces.

(d) The platform wall height of any unit made in conformance with ANSI A92.2-1979 shall be acceptable.

(e) After the effective date of this standard, units shall conform to the requirements of this subsection.

(f) Platforms with folding-type floors and steps or rungs may be used without rails and kick plates if a method is provided to allow personnel equipped with a body belt and safety strap or lanyard to attach themselves to the platform or boom.

(g) Platforms for aerial ladders shall have a kick plate at least four inches high or its equivalent, around three sides of the platform.

(h) Provision shall be made to allow personnel equipped in accordance with chapter 296-155 WAC, Part C-1 with a full body harness and safety strap or lanyard to attach themselves to the ladder rail.

(15) Specifications display. The aerial device shall have identification, operation, and instruction placards, decals, plates, or the equivalent, which are legible, permanent, and readily visible. There shall be installed on each aerial device applicable markings or provide these markings with appropriate installation instructions. The markings on the aerial device shall not be removed, defaced, or altered. All missing or defective markings shall be replaced.

(a) An aerial device shall have the following markings:

(i) Identification markings.

(ii) Operation markings.

(iii) Instruction markings.

(b) Aerial devices shall have markings to indicate the following:

(i) Make.

(ii) Model.

(iii) Insulated or noninsulated.

(iv) Qualification voltage and date of test.

(v) Serial number.

(vi) Rated load capacity.

(vii) Height.

(viii) Aerial device system pressure or aerial device system voltage, or both.

(c) Aerial devices shall have markings describing the function of each control. Markings shall be determined by the manufacturer or the manufacturer and user jointly to indicate hazards inherent in the operation of an aerial device and those hazards for which the aerial device does not provide protection. The following instruction markings shall be provided for:

(i) Electrical hazards involved in the operation of the machine to warn that an aerial device does not provide protection to the operator from contact with or in proximity to an electrically charged conductor when they are in contact with or in proximity to another conductor.

(ii) Electrical hazards involved in the operation of the machine to warn that an aerial device, when working on or in proximity to energized conductors, shall be considered energized, and that contact with the aerial device or vehicle under those conditions may cause serious injuries.

(iii) Hazards that result from failure to operate the equipment in a prescribed manner.

(iv) Information related to the use and load rating of the equipment for material handling.

(v) Information related to the use and load rating of the aerial device for alternate configurations.

(vi) Information related to operator cautions.

(d) The color, format, and substance shall conform to:

(i) American National Standard for Accident Prevention Signs, ANSI Z35.1-1972.

(ii) American National Standard for Accident Prevention Tags, ANSI Z35.2-1968.

(iii) American National Standard for Informational Signs Complementary to ANSI Z35.1-1972 Accident Prevention Signs, ANSI Z35.4-1973.

(16) Testing of new aerial devices: In addition to the manufacturer's prototype tests and quality control measures, each new aerial device, including mechanisms, shall be tested to the extent necessary to ensure compliance with the operational requirements of this subsection.

(a) Operational tests shall include the following:

(i) Boom(s) elevating and lowering mechanism.

(ii) Boom extension mechanism.

(iii) Rotating mechanism.

(iv) Stability tests.

(v) Safety devices.

(b) A visual inspection of the finished unit shall be made to determine whether the operational test has produced an adverse effect on any component. Whoever mounts an aerial device upon a vehicle shall, before the mobile unit is placed in operation, perform stability tests in accordance with the requirements of subsection (11) of this section, and the operational and visual tests in accordance with this subsection.

(17) Electrical tests: All electrical tests shall be performed in accordance with ANSI A92.2-1979.

(18) Test reports: A certified report of the tests, specified in this subsection, signed by a registered professional engineer, or an equivalent entity shall be provided with each unit.

(19) Manual requirement: Aerial devices shall comply with the requirements of this standard and shall be provided with manuals. The manuals shall contain:

(a) Descriptions, specifications, and ratings of the aerial device.

(b) The maximum system pressure and the maximum voltage of electrical systems which are part of the aerial device.

(c) Instructions regarding operation, maintenance, and specified welds.

(d) Replacement part information.

(e) Instructions for installing or mounting the aerial device.

(20) Inspections:

(a) Prior to initial use, all new or modified mobile units shall be inspected and tested by the owners and users to ensure compliance with the provisions of this standard and ANSI A92.2-1979.

(b) The inspection procedure for mobile units in regular service is divided into two classifications based upon the intervals at which inspections and tests shall be performed. Safe intervals shall be set by the user, within the limits recommended by the manufacturer, and are dependent upon the nature of the critical components of the mobile unit and the degree of their exposure to wear, deterioration, or malfunction. The two classifications are designated as "frequent" and "periodic" with respective intervals between inspections and tests, as defined below:

(i) Frequent inspection and test: Daily to monthly intervals, or before use, if not used regularly.

(ii) Periodic inspection and test: One to twelve month intervals.

(21) Frequent inspections: Items such as, but not limited to the following shall be inspected for defects at the intervals as defined in subsection (20)(b)(i) of this section or as specifically indicated, including observation during operation, for any defects which might appear between regular inspections. These tests and inspections shall be performed by the operator. Any suspected items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use.

(a) Operating controls and associated mechanisms for conditions interfering with proper operation.

(b) Operating controls and associated mechanisms for excessive component wear and contamination by foreign material.

(c) Visual and audible safety devices for malfunction.

(d) Hydraulic or pneumatic systems for observable deterioration or excessive leakage.

(e) Fiberglass and other insulating components for visible damage or contamination.

(f) Electrical apparatus for malfunction, signs of excessive dirt, and moisture accumulation.

(22) Periodic inspection. An inspection of the mobile unit shall be performed at the intervals defined in subsection (20)(b)(ii) of this section, depending upon its activity, severity of service, and environment, or as specifically indicated below. Any suspect items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use. Nondestructive inspection and testing methods shall be used where there are questionable structural components.

(a) Deformed, cracked, or corroded members in the aerial device structure.

(b) Worn, cracked or distorted parts, such as pins, bearings, shafts, gears, rollers, locking devices, chains, chain sprockets, wire ropes, and sheaves.

(c) Hydraulic and pneumatic relief valve settings.

(d) Hydraulic system for proper oil level.

(e) Hydraulic and pneumatic fittings, hoses, and tubing for evidence of leakage, abnormal deformation, or excessive abrasion.

(f) Compressors, pumps, motors, and generators for loose fasteners, leaks, unusual noises or vibrations, loss of operating speed, and excessive heating.

(g) Hydraulic and pneumatic valves for cracks in the valve housing, leaks, and sticking spools.

(h) Hydraulic and pneumatic cylinders and holding valves for malfunction and visible damage.

(i) Hydraulic and pneumatic filters for cleanliness and the presence of foreign material in the system indicating other component deterioration.

(j) Performance test of all boom movements.

(k) Condition and tightness of bolts and other fasteners.

(l) Welds, as specified by the manufacturer.

(m) Legible and proper markings of controls, ratings, and instructions.

(23) Electrical insulation rating tests: If the aerial device is considered, rated, and used as an insulated device, the electrical insulating components and system, after a thorough inspection for lack of cleanliness and other hazards, shall be tested for compliance with the rating of the aerial device in accordance with one of the following applicable methods and procedures:

(a) In accordance with section 5.2 of ANSI A92.2-1979 where adequate test facilities are available.

(b) In the field if the aerial device is equipped with electrical test electrodes. The insulated boom may be raised into a high voltage line whose voltage is as high as or higher than the voltage to be worked but not exceeding the design voltage of the aerial device. The electrical leakage current shall not exceed 1 microampere per line to ground per kilovolt applied.

(c) For units rated 69 kV and under, by placing a fused and protected ammeter in the circuit between a test powerline and the conductive metal assembly at the bucket end of the insulated boom.

(i) The lower end of the boom section to be tested shall be grounded.

(ii) The ammeter shall be shielded from any stray electrical currents, and shall give the measurement of any leakage current across the boom and controls, or any capacitive currents involved from the platform to ground, or both.

(iii) The minimum voltage of the test line shall be that of any circuit on which the aerial device is to be used but not exceeding the design voltage of the aerial device.

(iv) During a three minute test period, the total current through the ammeter shall not exceed the following limits at the corresponding rated line voltages:

Line Voltage (kV)	Maximum Current (Microamperes)
69	1000
34.5	500
13.2	200

(d) For units rated 69 kV and under and not used for bare hand application, a dc test voltage and procedure shall be used. The dc potential and leakage current limit shall be specified by the aerial device manufacturer or an equivalent entity.

(e) For platform liners, a retest at seventy percent of the original factory test voltage in accordance with the procedures of section 5.2.2.5 of ANSI A92.2-1979, or the equivalent shall be made.

(f) All electrical tests shall be performed only by qualified persons who are aware of the dangers.

(24) Inspection documentation:

(a) A check sheet or list of items to be inspected shall be provided to the operator or other authorized person for use in making frequent inspections. Records of frequent inspections need not be made. However, where a safety hazard is found, it shall be reported in writing to a person responsible for the corrective action and that report and a record of the correction shall be maintained.

(b) Written, dated, and signed reports and records shall be made of periodic inspections and tests and retained for a period of time consistent with need. Records shall be readily available. Manufacturer's recommendations as to the necessity and frequency of maintenance shall be followed.

(25) Modifications: No modifications or additions which affect the mechanical, hydraulic, or electrical integrity or the safe operation of the aerial device shall be made without the written approval of the manufacturer or an equivalent entity.

(a) If such modification or changes are made, the capacity, operation, and maintenance instruction markings shall be changed accordingly.

(b) In no case shall the safety factors be reduced below those specified in this standard, ANSI A92.2-1979, or below the manufacturer's design factors, whichever are greater.

(c) Changes in loading or additions made to the mobile unit after the final acceptance that affect weight distribution shall meet applicable loading regulations of the National Traffic and Motor Vehicle Safety Act of 1966 sections on Certification.

(26) Qualified operators: The user shall select and authorize only those persons qualified by training or experience, or both, to operate the aerial devices. Each operator shall be instructed in the safe and proper operation of the aerial device in accordance with the manufacturer's operator's manual and the user's work instructions.

(27) The truck shall not be moved until the boom or ladder is cradled and/or fastened down, the outrigger(s) retracted, and the power take-off disengaged, except for equipment which is specifically designed for this type of operation in accordance with provisions of subsections (1) and (2) of this section.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-48531, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-48531, filed 7/20/94, effective 9/20/94; 92-17-022 (Order 92-06), § 296-155-48531,

filed 8/10/92, effective 9/10/92; 91-03-044 (Order 90-18), § 296-155-48531, filed 1/10/91, effective 2/12/91; 90-17-051 (Order 90-10), § 296-155-48531, filed 8/13/90, effective 9/24/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48531, filed 1/21/86.]

WAC 296-155-48533 Crane or derrick suspended personnel platforms. (1) Scope, application, and definitions.

(a) Scope and application. This standard applies to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on the load lines of cranes or derricks.

(b) Definitions. For the purposes of this section, the following definitions apply:

(i) "Failure" means load refusal, breakage, or separation of components.

(ii) "Hoist" (or hoisting) means all crane or derrick functions such as lowering, lifting, swinging, booming in and out or up and down, or suspending a personnel platform.

(iii) "Load refusal" means the point where the ultimate strength is exceeded.

(iv) "Maximum intended load" means the total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

(v) "Runway" means a firm, level surface designed, prepared, and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

(2) General requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

(3) Cranes and derricks.

(a) Operational criteria.

(b) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform.

(c) Load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten times the maximum intended load. The required design factor is achieved by taking the current safety factor of 3.5 (required under WAC 296-155-525 (3)(b)) and applying the fifty percent derating of the crane capacity which is required by (f) of this subsection.

(d) Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position.

(e) The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them all fully deployed following manufacturer's specifications, insofar as applicable, when hoisting employees.

(f) The total weight of the loaded personnel platform and related rigging shall not exceed fifty percent of the rated

capacity for the radius and configuration of the crane or derrick.

(g) The use of machines having live booms (booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds) is prohibited.

(h) Multiple-part line block: When a multiple-part line block is in use, a substantial strap shall be used between the crane hook and common ring, shackle, or other equivalent device, to eliminate employee exposure to the lines running through the block, and to the block itself.

(4) Instruments and components.

(a) Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator.

(b) Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or an accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.

(c) A positive acting device shall be used which prevents contact between the load block or overhaul ball and the boom tip (anti-two-blocking device), or a system shall be used which deactivates the hoisting action before damage occurs in the event of a two-blocking situation (two block damage prevention feature).

(d) The load line hoist drum shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering). Free fall is prohibited.

(5) Rigging.

(a) Lifting bridles on box-type platforms shall consist of four legs of equal length, with one end securely shackled to each corner of the platform and the other end securely attached to a common ring, shackle, or other equivalent device to accommodate the crane hook, or a strap to the crane hook.

(b) Shackle bolts used for rigging of personnel platforms shall be secured against displacement.

(c) A substantial safety line shall pass through the eye of each leg of the bridle adjacent to the common ring, shackle, or equivalent device.

(d) Securely fastened with a minimum amount of slack to the lift line above the overhead ball or to the crane hook itself.

(e) All eyes in wire rope slings shall be fabricated with thimbles.

(f) Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant wire rope is used for slings, they shall be capable of supporting without failure at least ten times the maximum intended load.

(g) Hooks on overhead ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.

(h) Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the

materials necessary to do their work, and shall not be used for any other purpose when not hoisting personnel.

(6) Personnel platforms - design criteria.

(a) The personnel platform and suspension system shall be designed by a qualified engineer or a qualified person competent in structural design.

(b) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

(c) The personnel platform itself, except the guardrail system and body harness anchorages, shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load based on a minimum allowance of five hundred pounds for the first person with light tools, and an additional two hundred fifty pounds for each additional person.

(d) Criteria for guardrail systems and body harness anchorages are contained in Part C-1 of chapter 296-155 WAC.

(e) The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

(7) Platform specifications.

(a) Each personnel platform shall be equipped with a guardrail system which meets the requirements of chapter 296-155 WAC Part C-1 and, shall be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than one-half inch (1.27 cm).

(b) A grab rail shall be installed inside the entire perimeter of the personnel platform.

(c) Access gates, if installed, shall not swing outward during hoisting.

(d) Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.

(e) Headroom shall be provided which allows employees to stand upright in the platform.

(f) In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.

(g) All rough edges exposed to contact by employees shall be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.

(h) All welding of the personnel platform and its components shall be performed by a qualified welder familiar with the weld grades, types, and material specified in the platform design.

(i) Occupants of all personnel platforms shall wear a safety belt or harness and lanyard which meets the requirements of chapter 296-155 WAC Part C-1.

(j) Box-type platform: The workers lanyard shall be secured to an anchorage within the platform meeting the requirements of chapter 296-155 WAC Part C-1.

(k) Rescue platform:

(i) If the platform is used as a rescue vehicle, the injured worker shall be strapped into the stretcher or basket.

(ii) The basket shall then be secured by lanyard to an anchorage within the platform meeting the requirements of chapter 296-155 WAC Part C-1.

(l) Boatswains chair: The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(m) Barrel-type platform:

(i) The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(ii) A solid bar or rod shall be substantially attached in a rigid position to the bottom or side of the platform.

(iii) The bottom of the barrel-type platform shall be of a convex shape to cause the platform to lay on its side when lowered to the ground or floor.

(iv) The bar or rod shall extend a minimum of eight feet above the floor of the platform.

(v) Workers shall enter and exit from barrel-type platforms only when they are in an upright position, stable, and securely attached to the load line.

(vi) The employer shall use methods or devices which allow employees to safely enter or exit barrel-type platforms.

(8) Personnel platform loading.

(a) The personnel platform shall not be loaded in excess of its rated load capacity.

(b) The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.

(c) Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work, and shall not be used to hoist only materials or tools when not hoisting personnel.

(d) Materials and tools for use during a personnel lift shall be secured to prevent displacement.

(e) Materials and tools for use during a personnel lift shall be evenly distributed within the confines of the platform while the platform is suspended.

(9) Trial lift, inspection, and proof testing.

(a) A trial lift with the unoccupied personnel platform loaded at least to the anticipated lightweight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls, and safety devices are activated and functioning properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the fifty percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift can be loaded in the platform, as provided in subsection (8)(d) and (e) of this section for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single set-up position.

(b) The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated when the lift route is changed unless the operator determines that the route change is not significant (i.e., the route change would not affect the safety of hoisted employees).

(c) After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced. Employees

shall not be hoisted unless the following conditions are determined to exist:

- (i) Hoist ropes shall be free of kinks;
- (ii) Multiple part lines shall not be twisted around each other;
- (iii) The primary attachment shall be centered over the platform; and
- (iv) The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

(d) A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.

(e) Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.

(f) At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to one hundred twenty-five percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

(10) Work practices.

(a) Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

(b) Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

(c) Tag lines shall be used unless their use creates an unsafe condition.

(d) The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

(e) Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

(f) Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone such as by radio may be used.

(g) Hand signals to the operator shall be in accordance with WAC 296-155-525 (1)(c).

(h) Except over water, employees occupying the personnel platform shall use a full body harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage as specified in chapter 296-155 WAC, Part C-1. When working over water, the requirements of WAC 296-155-235 shall apply.

(i) No lifts shall be made on another of the crane's or derrick's load lines while personnel are suspended on a platform.

(11) Traveling.

(a) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and locomotive cranes, or where the employer demonstrates that there is no less hazardous way to perform the work.

(b) Under any circumstances where a crane would travel while hoisting personnel, the employer shall implement the following procedures to safeguard employees:

(i) Crane travel shall be restricted to a fixed track or runway;

(ii) Travel shall be limited to the load radius of the boom used during the lift; and

(iii) The boom must be parallel to the direction of travel.

(c) A complete trial run shall be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by subsection (9)(a) of this section which tests the route of the lift.

(d) If travel is done with a rubber tired-carrier, the condition and air pressure of the tires shall be checked. The chart capacity for lifts on rubber shall be used for application of the fifty percent reduction of rated capacity. Notwithstanding subsection (3)(e) of this section, outriggers may be partially retracted as necessary for travel.

(12) Prelift meeting.

(a) A meeting attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed shall be held to review the appropriate requirements of this section and the procedures to be followed.

(b) This meeting shall be held prior to the trial lift at each new work location, and shall be repeated for any employees newly assigned to the operation.

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WAC 296-155-500 Reserved.

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WAC 296-155-515 Reserved.

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WAC 296-155-525 Cranes and derricks. (1)

Definitions applicable to this part:

Accessory - a secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.

Administrative or regulatory authority - a governmental agency, or the employer in the absence of governmental jurisdiction.

Angle indicator (boom) - an accessory which measures the angle of the boom to the horizontal.

Appointed - assigned specific responsibilities by the employer or the employer's representative.

Authorized person - means a person approved or assigned by the employer to perform a specific type of duty or duties or be at a specific location or locations at the workplace.

Auxiliary hoist - a secondary hoist rope system used either in conjunction with, or independently of, the main hoist system.

Axis of rotation - the vertical axis around which the crane superstructure rotates.

Axle - the shaft or spindle with which or about which a wheel rotates. On wheel-mounted cranes it refers to a type of axle assembly including housings, gearing, differential, bearings, and mounting appurtenances.

Axle (bogie) - two or more axles mounted in tandem in a frame so as to divide the load between the axles and permit vertical oscillation of the wheels.

Ballast - weight used to supplement the weight of the machine in providing stability for lifting working loads (the term **ballast** is normally associated with locomotive cranes).

Base, anchor bolt - a crane base that is bolted to a footing.

Base, expendable - for static-mounting cranes, a style of bottom mast section or member that is cast into a concrete footing block; all or part of this component is lost to future installations.

Base, fixed - a crane base that does not travel. It may be expendable, knee braced, or anchor bolted.

Base (mounting) - the traveling base on which the rotating superstructure of a locomotive or crawler crane is mounted.

Base, tower crane - the lowermost supporting component of the crane.

Base, travel - a crane base that is a ballasted platform mounted on trucks that ride along rails.

Boom (crane) - a member hinged at the rotating superstructure and used for supporting the existing tackle.

Boom angle - the angle above or below horizontal of the longitudinal axis of the base boom section.

Boom hoist mechanism - means for supporting the boom and controlling the boom angle.

Boom point - the outer extremity of the crane boom, containing the hoist sheave assembly.

Boom point sheave assembly - an assembly of sheaves and pin built as an integral part of the boom point.

Boom stop - a device used to limit the angle of the boom at the highest recommended position.

Brake - a device used for retarding or stopping motion.

Brace, tower - a structural attachment placed between a crane tower and an adjacent structure to pass loads to the adjacent structure and permit the crane to be erected to greater than free standing height.

Buffer - an energy absorbing device for reducing impact when a moving crane or trolley reaches the end of its permitted travel.

Cab - a housing which covers the rotating superstructure machinery, or the operator's or driver's station.

Climbing frame - a frame used with climbing cranes to transmit operational and climbing reactions to the host building frame.

Climbing ladder - a steel member with crossbars (used in parts) suspended from a climbing frame and used as jacking support points when some cranes climb.

Clutch - a means for engagement or disengagement of power.

Commercial truck vehicle - a commercial motor vehicle designed primarily for the transportation of property in connection with business and industry.

Counterweight - weight used to supplement the weight of the machine in providing stability for lifting working loads.

Counterweight jib - a horizontal member of a crane on which the counterweights and usually the hoisting machinery are mounted.

Crane carrier - the undercarriage of a wheel-mounted crane specifically designed for transporting the rotating crane superstructure. It may or may not provide its own travel mechanism. It is distinguished from a commercial truck vehicle in that it is not designed to transport personnel, materials, or equipment other than the crane-rotating superstructure.

Cross-over points - in multiple layer spooling of rope on a drum, those points of rope contact where the rope crosses the preceding rope layer.

Designated - selected or assigned by the employer or the employer's representative as being competent to perform specific duties.

Drum - the cylindrical member around which a rope is wound for lifting and lowering the load or boom.

Dynamic (loading) - loads introduced into the machine or its components due to accelerating or decelerating forces.

Flange point - a point of contact between rope and drum flange where the rope changes layers.

Free standing height - that height of a crane which is supported by the tower (mast) alone without assistance from braces, guys, or other means.

Gage, track - the horizontal distance between two rails measured perpendicular to the direction of travel.

Gantry (A-frame) - a structural frame, extending above the superstructure, to which the boom support ropes are reeved.

High strength (traction) bolts - high strength tensile bolts used in the assembly of crane sections. The bolts are installed in tension by torquing or other means at a level greater than that produced by in- or out-of-service loads for the purpose of reducing the likelihood of bolt fatigue failure.

Hoist mechanism - a hoist drum and rope reeving system used for lifting and lowering loads.

Jib - an extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles in the vertical plane of the boom.

Jib backstop - a device which will restrain the jib from turning over backward.

Job site - work area defined by the construction contract.

Limiting device - a mechanical device which is operated by some part of a power driven machine or equipment to control loads or motions of the machine or equipment.

Load (working) - the external load in pounds (kilograms) applied to the crane, including the weight of load-attaching equipment such as lower load block, shackles, and slings.

Load block, lower - the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.

Load block, upper - the assembly of shackle, swivel, sheaves, pins, and frame suspended from the boom point.

Load ratings - crane ratings in pounds (kilograms) established by the manufacturer.

Mast (boom) - a frame hinged at or near the boom hinge for use in connection with supporting a boom. The head of the mast is usually supported and raised or lowered by the boom hoist ropes.

Mast (jib) - a frame hinged at or near the boom point for use in connection with supporting a jib.

Normal operating conditions.

Cab- or station-operated cranes - conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices on the crane, and no other persons except those appointed are to be on the crane.

Ground- or floor-operated cranes - conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices that are mounted to the crane but operated with the operator off the crane, and no other persons except those appointed are to be on the crane.

Remote-operated cranes - conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices that are mounted to any part of the crane, and no other persons except those appointed are to be on the crane.

Out-of-service - the condition of a crane when unloaded, without power and with the controls unattended and prepared to endure winds above the in-service level.

Outriggers - extendable or fixed members attached to the mounting base, which rest on supports at the outer ends used to support the crane.

Pawl (dog) - a device for positively holding a member against motion in one or more directions.

Payload - that load or loads being transported by the commercial truck chassis from place to place.

Pendant - a rope or strand of specified length with fixed end connections.

Pitch diameter - the diameter of a sheave or rope drum measured at the center line of the rope.

Power-controlled lowering - a system or device in the power train, other than the load hoist brake, which can control the lowering rate of speed of the load hoist mechanism.

Qualified person - a person who, by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.

Radius (load) - the horizontal distance from a projection of the axis of rotation to the base of the crane, before loading, to the center of the vertical hoist line or tackle with load applied.

Rail clamp - a tong-like metal device mounted on a locomotive crane car, which can be connected to the track.

Reeving - a rope system in which the rope travels around drums and sheaves.

Remote control station - a location, not on the crane, from which the operator can control all the crane movements.

Repetitive pickup point - when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.

Rope - refers to wire rope unless otherwise specified.

Rotation resistant rope - a wire rope consisting of an inner layer of strand laid in one direction covered by a layer of strand laid in the opposite direction. This has the effect of counteracting torque by reducing the tendency of the finished rope to rotate.

Running rope - a rope which travels around sheaves or drums.

Shall - this word indicates that the rule is mandatory and must be followed.

Service, light - service that involves irregular operation with loads generally about one-half or less of the rated load; a service crane at a storage yard or building site would be an example.

Service, normal - service that involves operating occasionally at rated load but normally at less than eighty-five percent of the rated load and not more than ten lift cycles per hour except for isolated instances; a crane used for concrete placement at a building site would be an example.

Service, heavy - service that involves operating at eighty-five percent to one hundred percent of the rated load or in excess of ten lift cycles per hour as a regular specified procedure; some cranes operating at material yards or in industrial applications may fall into this category.

Sheave - a grooved wheel or pulley used with a rope to change the direction and point of application of a pulling force.

Should - this word indicates that the rule is a recommendation, the advisability of which depends on the facts in each situation.

Side loading - a load applied to an angle to the vertical plane of the boom.

Stabilizer - stabilizers are extendable or fixed members attached to the mounting base to increase the stability of the crane, but which may not have the capability of relieving all of the weight from wheels or tracks.

Standby crane - a crane which is not in regular service but which is used occasionally or intermittently as required.

Standing (guy) rope - a supporting rope which maintains a constant distance between the points of attachment to the two components connected by the rope.

Structural competence - the ability of the machine and its components to withstand the stresses imposed by applied loads.

Superstructure - the rotating upper frame structure of the machine and the operating machinery mounted thereon.

Swing - rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

Swing mechanism - the machinery involved in providing rotation of the superstructure.

Swivel - a load carrying member with thrust bearings to permit rotation under load in a plane perpendicular to the direction of the load.

Swiveling - the rotation of the load attachment portion (hook or shackle) of a load block (lower) or hook assembly about its axis of suspension in relation to the load line(s).

Tackle - an assembly of ropes and sheaves arranged for lifting, lowering, or pulling.

Telescoping boom - consists of a base boom from which one or more boom sections are telescoped for additional length.

Telescoping (tower crane) - a process whereby the height of a traveling or fixed base crane is increased typically by raising the inner tower and then adding sections at the top of the outer tower; there are also cranes that are telescoped by adding to the inner tower from below.

Tower (mast) - a vertical structural frame consisting of columns and bracing capable of supporting an upperstructure with its working and dynamic loads and transmitting them to the supporting surface or structure.

Traction (high strength) bolts - see high strength bolts.

Transit - the moving or transporting of a crane from one job site to another.

Travel - the function of the machine moving under its own power from one location to another on a job site.

Trolley - the device that travels along the load jib and contains the upper load block.

Two-blocking - the condition in which the lower load block or hook assembly comes in contact with the upper load block or boom point sheave assembly.

Weather vaning - wind induced rotation of a crane upperstructure, when out-of-service, to expose minimal surface area to the wind.

Wedge - a tapered wood or steel device used to provide stability to cranes during use as a climber. When the wedges are tightened against the four main legs of the tower, they convert overturning moments into horizontal forces to be resisted by the floor framing or slab.

Wheel base - the distance between centers of front and rear axles. For a multiple axle assembly the axle center for wheel base measurement is taken as the midpoint of the assembly.

Whipline (runner or auxiliary) - a secondary rope system usually of lighter load capacity than that provided by the main rope system.

Winch head - a power driven spool for handling of loads by means of friction between fiber or wire rope and the spool.

(2) General requirements.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks. Where manufacturer's specifications are not available the limitations assigned to the equipment shall be based on the determinations of a qualified engineer, competent in this field and such determinations will be appropriately documented and recorded. Attachments used with cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

(b) Rated load capacities, and recommended operating speeds, and special hazard warnings, or instruction, shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to the operator while at the control station.

(c) Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals shall be posted at the job site.

(d) The employer shall designate a competent person who shall inspect all machinery and equipment prior to each use, and periodically during use to make sure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use.

(e) A thorough, annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the department. The employer shall maintain a permanent record of the dates and results of all inspections for each hoisting machine and piece of equipment.

(f) A tag line or guide rope shall be used on all loads that swing freely. Guide ropes or tag lines shall be held by experienced persons.

(g) Care shall be taken to guard against injury to workers, or damage to scaffolds or buildings, from swinging loads.

(h) The operator shall avoid carrying loads over people.

(i) When work is stopped or when the derrick is not in operation, the boom shall be lowered to a horizontal position or tied in place to prevent it whipping with the wind or other external force.

(j) Only authorized personnel shall make sling hitches on loads.

(k) Workers shall not be allowed to ride on loads handled by derricks.

(l) Operators shall observe signals only from duly authorized persons. Under no circumstances shall a load be moved until the signal is received from authorized personnel.

(m) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such

parts are exposed to contact by employees, or otherwise create a hazard. Guarding shall meet the requirements of chapter 296-24 WAC.

(n) A minimum distance of thirty inches clearance shall be maintained between the swing radius of the greatest extension of the crane superstructure or counterweights and a stationary object, including the crane itself, while the crane is in operation. When this clearance cannot be maintained, suitable barricades or safeguards shall be used to isolate the pinch point hazard area.

(o) All exhaust pipes shall be guarded or insulated where contact by employees, in the performance of normal duties, is possible.

(3) Additional requirements.

(a) Whenever internal combustion engine powered equipment exhausts in enclosed spaces, tests shall be made and recorded to see that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres. (See chapter 296-62 WAC, the general occupational health standards and other applicable standards.)

(b) All cab glazing shall be safety glazing material. Windows shall be provided in the front and on both sides of the cab or operator's compartment with visibility forward and to either side. Visibility forward shall include a vertical range adequate to cover the boom point at all times. The front window may have a section which can be readily removed or held open, if desired. If the section is of the type held in the open position, it shall be secured to prevent inadvertent closure. A windshield wiper should be provided on the front window.

(c)(i) Where necessary for rigging or service requirements, a ladder or steps shall be provided to give access to a cab roof.

(ii) On cranes, guardrails, handholds and steps shall be provided for easy access to the car and cab in accordance with chapter 296-155 WAC, Part C-1 and Part J.

(iii) Platforms and walkways shall have anti-skid surfaces.

(d) Fuel tank filler pipe shall be located in such a position, or protected in such manner, as to not allow spill or overflow to run onto the engine, exhaust, or electrical equipment of any machine being fueled.

(i) An accessible fire extinguisher of 5BC rating, or higher, shall be available at all operator stations or cabs of equipment.

(ii) All fuels shall be transported, stored, and handled to meet the rules of Part D of this chapter. When fuel is transported by vehicles on public highways, department of transportation rules concerning such vehicular transportation are considered applicable.

(e) Except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet;

(ii) For lines rated over 50 kV., minimum clearance between the lines and any part of the crane or load shall be

10 feet plus 0.4 inch for each 1 kV. over 50 kV., or twice the length of the line insulator, but never less than 10 feet;

(iii) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV., and 10 feet for voltages over 50 kV. up to and including 345 kV., and 16 feet for voltages up to and including 750 kV;

(iv) A person shall be designated to observe clearance of the equipment and give timely warning to insure that the required separation is maintained for all operations where it is difficult for the operator to maintain the desired clearance by visual means;

(v) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation;

(vi) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded;

(vii) Prior to work near transmitter tower where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be deenergized or tests shall be made to determine if electrical charge is induced on the crane.

(f) The following precautions shall be taken when necessary to dissipate induced voltage:

(i) The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and

(ii) Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

(iii) Combustible and flammable materials shall be removed from the immediate area prior to operations.

(g) No modifications or additions which affect the capacity or safe operation of the equipment shall be made by the employer without the manufacturer's or a qualified engineer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

(h) The employer shall comply with Power Crane and Shovel Association, Mobile Hydraulic Crane Standard No. 2.

(i) Sideboom cranes mounted on wheel or crawler tractors shall meet the requirements of SAE J743a-1964.

(4) Crawler, locomotive, and truck cranes.

(a) All jibs shall have positive stops to prevent their movement of more than 5° above the straight line of the jib and boom on conventional type crane booms. The use of cable type belly slings does not constitute compliance with this standard.

(b) All crawler, truck or locomotive cranes in use shall meet the applicable requirements for design, inspection, construction, testing, maintenance and operation as pre-

scribed in the ANSI B30.5-1989, Safety Code for Crawler, Locomotive and Truck Cranes.

(5) Tower cranes.

(a) Tower cranes shall be erected, jumped and dismantled under the immediate supervision of a competent person, designated by the employer.

(b) Tower cranes shall be erected, maintained and used in accordance with the manufacturer's specifications, recommendations and procedures. All modifications shall be approved by the manufacturer and engineered by a professional engineer. The safety factors shall not be reduced by any modifications. The crane plates and charts shall be changed to reflect any modifications made.

(c) A professional engineer shall certify that the crane foundations and underlying soil are adequate support for the tower crane with its maximum overturning movement.

(d) Tower cranes shall be positioned whereby they can swing 360° without either the counterweight or jib striking any building, structure or other object, except:

(i) If the crane can strike an object or another crane, suitable limit switches shall be installed which will prohibit contact with such objects, or;

(ii) Direct voice communications shall be established between any operator of the tower crane(s) involved and a signalperson so stationed where the boom and/or counterweight movement, and the object with which it may contact can be observed so that the operator(s) can be warned of imminent danger.

(iii) A secondary means of positive communications shall be established as a back-up for possible direct voice communication failure.

(iv) Radio communication systems without tone coded squelch are prohibited. Citizens band radios shall not be used as a means of communications for tower cranes.

(e) Prior to installing a climbing tower crane within an existing building or new construction, a structural engineer shall certify that the building is designed to withstand the torque and floor loading created by the crane to be installed.

(f) Tower cranes erected on a new foundation shall be tested in accordance with ANSI B30.3-1990 Chapter 3-1.

(i) The test shall consist of suspending a load of not less than 110% of the rated capacity for 15 minutes. The load shall be suspended from the furthest point of the length of boom (jib) to be used. The results of this test shall be within the manufacturer's recommendations and/or specifications.

(ii) A record of each test shall be made and signed by the person responsible for conducting the test. Such records shall be maintained on the construction site for the duration of the construction work for which it was erected and subsequently made a part of the firm's permanent equipment records. Records shall be made available to authorized representatives of the department, upon request.

(g) A capacity chart shall be furnished by each crane manufacturer which shall include a full and complete range of crane load ratings at all stated operating radii for each allowable speed and each recommended counterweight load.

(i) Such chart shall be posted in the operator's cab or at the remote control stand in use. In lieu of the chart at the remote control stand, a minimum of two weight capacity signs shall be affixed to the jib or boom.

(ii) The chart shall be visible and readable to the operator while at the normal operating position.

(h) Operating controls shall be properly marked to indicate the function of the controls in each position.

(i) An operating and maintenance manual written in the English language shall be provided with each tower crane.

(j) Limit switches shall be installed and shall be kept properly adjusted. They shall be protected or isolated in a manner which will prevent unauthorized tampering. Limit switches shall provide the following functions:

(i) Safely limit the travel of the trolley to prevent it from hitting the outer end of the jib.

(ii) Limit the upward travel of the load block to prevent two-blocking.

(iii) Lower over travel limiting devices shall be provided for all load hoists where the hook area is not visible to the operator.

(iv) Limit the load being lifted in a manner whereby no more than 110% of the maximum rated load can be lifted or moved.

(k) The crane shall not be used to pull vehicles of any type, remove piling, loosen form work, pull away loads which are attached to the ground or walls, or for any operation other than the proper handling of freely suspended loads.

(l) When the operator may be exposed to the hazard of falling objects, the tower crane cab and/or remote control station shall have adequate overhead protection.

(m) The operator shall be protected from the weather. If enclosed cabs are provided they shall provide clear visibility in all directions and glass shall be approved safety glass or the equivalent.

(n) An approved and safe means shall be provided for access to operator's cab and machinery platform.

(o) When necessary for inspection or maintenance purposes, ladders, walkways with railing or other devices shall be provided.

(p) Each tower crane shall be provided with a slewing brake capable of preventing the jib or boom from rotating in either direction and stopping the rotation of the jib or boom while loaded, when desired. Such brake shall have a holding device which, when set, will hold the jib or boom in a fixed location without additional attention of the operator. When the crane is out of operation, the jib or boom shall be pointed downwind and the slewing brake shall be released so as to permit the jib or boom to weathervane, providing the jib or boom has a clear 360 degree rotation. Where a 360 degree rotation is not provided, the jib or boom shall be pointed downwind from the prevailing wind and the slewing brake set.

(q) Each tower crane shall be provided with a braking system on the trolley capable of stopping and holding the trolley in any desired position while carrying a maximum load. This brake shall be capable of being locked in a fixed location without additional attention of the operator. An automatic brake or device shall be installed which will immediately stop and lock the trolley in position in the event of a breakage of the trolley rope.

(r) All electrical equipment shall be properly grounded and protection shall be provided against lightning.

(s) When the operator is actually operating the crane, the operator shall remain in a stationary position.

(t) All crane brakes shall automatically set in event of power failure. Swing brakes shall also function in this manner or be capable of being set manually.

(u) Climbing jack systems used for raising a tower crane shall be equipped with over-pressure relief valves, direct-reading pressure gauges, and pilot-operated hydraulic check valves installed in a manner which will prevent jack from retracting should a hydraulic line or fitting rupture or fail.

(v) During periods of high winds or weather affecting visibility, i.e., fog, etc., only loads shall be handled that are consistent with good safety practices. Good safety practices shall be mutually agreed upon by the operator and the person in charge of the construction job, with due consideration given to manufacturer's specifications and recommendations.

(w) Counterweights shall be securely fastened in place and shall not exceed the weight as recommended by the manufacturer for the length of jib being used. However, an amount of counterweight as recommended by the manufacturer shall be used.

(x) Tower cranes shall be inspected and maintained in accordance with the manufacturer's recommendations or more frequently if there is reason to suspect a possible defect or weakening of any portion of the structure or equipment.

(y) Guy wires, wedges, braces or other supports shall be inspected at the beginning and at midpoint of each working shift to ascertain that they are functioning as intended.

(6) Additional tower crane requirements.

(a) An approved method shall be instituted for transmitting signals to the operator. Standard hand signals for crane operations shall be used, whenever possible; however, if conditions are such that hand signals are ineffective, radio-controlled or electric-whistle signal or two-way voice communication shall be used. (See WAC 296-155-525 (4)(d).)

(b) Tower cranes shall not be erected or raised when the wind velocity at the worksite exceeds 20 m.p.h. or that specified by the manufacturer.

(c) Tower crane operators shall be trained and experienced in tower crane operations; however, for gaining experience, persons may operate the tower crane if under the immediate supervision of an experienced operator.

(d) Adequate clearance shall be maintained between moving and rotating structures of the crane and fixed objects to allow the passage of employees without harm.

(e) Employees required to perform duties on the horizontal boom of hammerhead tower cranes shall be protected against falling by guardrails or by a full body harness and lanyards attached to crane or to lifelines in conformance with Part C-1 of this chapter.

(f) Buffers shall be provided at both ends of travel of the trolley.

(g) Cranes mounted on rail tracks shall be equipped with limit switches limiting the travel of the crane on the track and stops or buffers at each end of the tracks.

(h) All hammerhead tower cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed by the manufacturer.

(i) Access ladders inside the telescoping sections of tower cranes are exempt from those sections of the safety

standards pertaining to cleat length and cleat spacing, but shall conform to manufacturer's recommendations and specifications.

(7) Overhead and gantry cranes.

(a) The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block, and this marking shall be clearly legible from the ground or floor.

(b) Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

(c) Except for floor-operated cranes, a gong or other effective audible warning signal shall be provided for each crane equipped with a power traveling mechanism.

(d) All overhead and gantry cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed in ANSI B30.2.0-1990, Safety Code for Overhead and Gantry Cranes.

(8) Derricks. All derricks in use shall meet the applicable requirements for design, construction, installation, inspection, testing, maintenance, and operation as prescribed in American National Standard Institute B30.6-1990, Safety Code for Derricks.

(9) Floating cranes and derricks.

(a) Mobile cranes mounted on barges.

(i) When a mobile crane is mounted on a barge, the rated load of the crane shall not exceed the original capacity specified by the manufacturer.

(ii) A load rating chart, with clearly legible letters and figures, shall be provided with each crane, and securely fixed at a location easily visible to the operator.

(iii) When load ratings are reduced to stay within the limits for list of the barge with a crane mounted on it, a new load rating chart shall be provided.

(iv) Mobile cranes on barges shall be positively secured.

(b) Permanently mounted floating cranes and derricks.

(i) When cranes and derricks are permanently installed on a barge, the capacity and limitations of use shall be based on competent design criteria.

(ii) A load rating chart with clearly legible letters and figures shall be provided and securely fixed at a location easily visible to the operator.

(iii) Floating cranes and floating derricks in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, and operation as prescribed by the manufacturer.

(c) Protection of employees working on barges. The employer shall comply with the applicable requirements for protection of employees as specified in WAC 296-155-630.

(10) Mobile cranes and excavation machines.

(a) In all power driven shovel operations the person in charge shall issue instructions necessary to prevent accidents, to detect and correct unsafe acts and dangerous conditions, and to enforce all safety rules and regulations.

The person in charge shall also issue instructions on the proper method of using tools and handling material.

(b) Where the ground is soft or uneven, timbering and planking shall be used to provide firm foundation and distribute the load.

(c) In case of a breakdown, the shovel shall be moved away from the foot of the slope before repairs are made.

(d) All persons shall keep away from the range of the shovel's swing and shall not be permitted to stand back of the shovel or in line with the swing of the dipper during operation or moving of shovel.

(e) Unauthorized persons shall not be allowed on the shovel during operations, and the operator shall not converse with other persons while operating machine.

(f) The shovel dipper shall rest on the ground or on blocking during shut down periods.

(g) Shovels shall be inspected daily and all defects promptly repaired.

(h) All rubber tired mobile cranes shall be equipped with outriggers and sufficient blocking to properly stabilize crane while operating.

(i) Rubber tired mobile cranes shall be equipped with rear view mirrors.

(j) Positive boom stops shall be provided on all mobile cranes of the wheel and crawler type.

(k) Length of a crane boom and amount of counterweight shall not exceed manufacturer's rated capacity for equipment involved; except on isolated cases where permission is granted by the department.

(l) On all cranes where wedge beackets are used as terminal connections, the proper size wedge shall be used.

(m) On all mobile cranes, the hoist and boom drums shall be provided with a positive operated pawl or dog which shall be used in addition to the brake to hold the load and boom when they are suspended. Counterweight operated dogs are prohibited.

(n) Oiling and greasing shall be done under safe conditions with machine at rest, except when motion of machine is necessary.

(o) All steps, running boards, and boom ladder shall be of substantial construction and in good repair at all times.

(p) Operators shall not leave the cab while master clutch is engaged.

(q) Fire extinguishers shall be readily accessible and within reach of operator at all times.

(r) All shovel and crane cabs shall be kept clean and free of excess oil and grease on floor and machinery. Oily and greasy rags shall be disposed of immediately after use and not allowed to accumulate.

(s) Tools shall not be left on the cab floor. Spare cans of oil or fuel, and spare parts, shall not be stored in cabs, except in approved racks provided for that purpose.

(t) Mats or planking shall be used in moving shovels or cranes over soft or uneven ground.

(u) Cranes or shovels setting on steep grades shall be securely blocked or secured with a tail hold.

(v) Smoking shall be prohibited while fueling or oiling machines.

(w) Gasoline powered motors shall be stopped during refueling.

(x) Handling of movable feed line (bologna) shall be accomplished with insulated hooks and lineman's rubber gloves.

(y) Where cables cross roads they shall be elevated or placed in a trench.

(z) On all power shovels, including back-hoe types, of one-half cubic yard capacity or over, and on all dragline cranes or all-purpose cranes of the crawler or wheel type, two persons shall constitute the minimum working crew. It is mandatory that one be a qualified operator of the equipment in use. The job title of the other crew member may be oiler, rigger, signal person, or a laborer. The primary purpose of the second crew member is to signal the operator when the operator's vision is impaired or obscured and to be on-hand in case of emergency.

(i) Second-crew persons shall be properly trained in their second-person required skills.

(ii) The second crew member shall be close enough to the machine in operation to be aware of any emergency, if one arises, and to assure the machine is operated with necessary and appropriate signals to the operator.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-155-525, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-525, filed 1/10/91, effective 2/12/91; Order 76-29, § 296-155-525, filed 9/30/76; Order 74-26, § 296-155-525, filed 5/7/74, effective 6/6/74.]

WAC 296-155-527 Appendix A to WAC 296-155-525. Due to crane design configuration to maintain mobility, sheave diameters and rope, design factors are limited. Because of these limited design parameters, inspection to detect deterioration in accordance with subsections below and timely replacement are essential.

(1) Frequent inspection.

(a) All running ropes in service should be visually inspected once each working day. A visual inspection shall consist of observation of all rope which can reasonably be expected to be in use during the day's operations. These visual observations should be concerned with discovering gross damage, such as listed below, which may be an immediate hazard:

(i) Distortion of the rope such as kinking, crushing, unstranding, birdcaging, main strand displacement, or core protrusion. Loss of rope diameter in a short rope length or unevenness of outer strands should provide evidence that the rope or ropes must be replaced.

(ii) General corrosion.

(iii) Broken or cut strands.

(iv) Number, distribution and type of visible broken wires. (See subsection below for further guidance.)

(v) Core failure in rotation resistant ropes. When such damage is discovered the rope shall be either removed from service or given an inspection as detailed in periodic inspection.

(b) Care shall be taken when inspecting sections of rapid deterioration such as flange points, crossover points and repetitive pickup points on drums.

(c) Care shall be taken when inspecting certain ropes such as the following:

(i) Rotation resistant ropes, because of their higher susceptibility to damage and increased deterioration when working on equipment with limited design parameters. The internal deterioration of rotation resistant ropes may not be readily observable.

(ii) Boom hoist ropes, because of the difficulties of inspection and the important nature of these ropes.

(2) Periodic inspection.

(a) The inspection frequency shall be determined by a qualified person and shall be based on such factors as expected rope life as determined by experience on the particular installation or similar installations, severity of environment, percentage of capacity lifts, frequency rates of operation, and exposure to shock loads. Inspections need not be at equal calendar intervals and should be more frequent as the rope approaches the end of its useful life. This inspection shall be performed at least annually.

(b) Periodic inspections shall be performed by a qualified person. This inspection shall cover the entire length of rope. Only the surface wires of the rope need be inspected. No attempt should be made to open the rope. Any deterioration resulting in an appreciable loss of original strength, such as described below, shall be noted and determination made as to whether further use of the rope would constitute a hazard:

(i) Points listed in subsection (1) of this section (Frequent inspection).

(ii) Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.

(iii) Severely corroded or broken wires at end connections.

(c) Care shall be taken when inspecting sections of rapid deterioration, such as the following:

(i) Sections in contact with saddles, equalizer sheaves, or other sheaves where rope travel is limited;

(ii) Sections of the rope at or near terminal ends where corroded or broken wires may protrude.

(3) Rope replacement.

(a) No precise rules can be given for determination of the exact time for replacement of rope, since many variable factors are involved. Continued use in this respect depends largely upon good judgment by an appointed or authorized person in evaluating remaining strength in a used rope after allowance for deterioration disclosed by inspection. Continued rope operations depends upon this remaining strength.

(b) Conditions such as the following shall be sufficient reason for questioning continued use of the rope or increasing the frequency of inspection:

(i) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay (for special conditions relating to rotation resistant rope refer to paragraph 5-3.2.1.1 (d)(1)(b) ANS/ASME B30.5 1989).

(ii) One outer wire broken at the point of contact with the core of the rope which has worked its way out of the rope structure and protrudes or loops out from the rope structure. Additional inspection of this section is required.

(iii) Wear of one-third the original diameter of outside individual wires.

(iv) Kinking, crushing, birdcaging, or any other damage resulting in distortion of the rope structure.

(v) Evidence of any heat damage from any cause.

(vi) Reductions from nominal diameter of more than:

(A) 1/64 in. (0.4 mm) for diameters up to and including 5/16 in. (8.0 mm);

(B) 1/32 in. (0.8 mm) for diameters 3/8 in. (9.5 mm) to and including 1/2 in. (13.0 mm);

(C) 3/64 in. (1.2 mm) for diameters 9/16 in. (14.5 mm) to and including 3/4 in. (19.0 mm);

(D) 1/6 in. (1.6 mm) for diameters 7/8 in. (22.0 mm) to and including 1 1/8 in. (38.0 mm).

(vii) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(c) Replacement rope shall have a strength rating at least as great as the original rope furnished or recommended by the crane manufacturer. Any deviation from the original size, grade, or construction shall be specified by a rope manufacturer, the crane manufacturer or a qualified person.

(d) Rope not in regular use. All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given an inspection before it is placed in service. This inspection shall be for all types of deterioration and shall be performed by an appointed or authorized person.

(e) Inspection records:

(i) Frequent inspection; no records required.

(ii) Periodic inspection: In order to establish data as a basis for judging the proper time for replacement, a dated report of rope condition at each periodic inspection shall be kept on file. This report shall cover points of deterioration. If the rope is replaced only that part need be recorded.

(f) A long-range inspection program should be established and should include records on the examination of ropes removed from service so that a relationship can be established between visual observation and actual condition of the internal structure.

(4) Rope maintenance.

(a) Rope should be stored to prevent damage or deterioration.

(b) Unreeling or uncoiling of rope shall be done as recommended by the rope manufacturer and with care to avoid kinking or inducing a twist.

(c) Before cutting a rope, seizings shall be placed on each side of the place where the rope is to be cut to prevent unlaying of the strands. On preformed rope, one seizing on each side of the cut is required. On nonpreformed ropes of 7/8 in. (22 mm) diameter or smaller, two seizings on each side of the cut are required, and for nonpreformed rope of 1 in. (26 mm) diameter or larger, three seizings on each side of the cut are required.

(d) During installation, care should be exercised to avoid dragging of the rope in dirt or around objects which will scrape, nick, crush, or induce sharp bends in it.

(e) Rope should be maintained in a well lubricated condition. It is important that lubricant applied as part of a maintenance program shall be compatible with the original lubricant, and to this end, the rope manufacturer should be consulted; lubricant applied shall be of the type which does not hinder visual inspection. Those sections of rope which are located over sheaves or otherwise hidden during inspection and maintenance procedures require special attention when lubricating rope. The object of rope lubrication is to reduce internal friction and to prevent corrosion.

(f) When an operating rope shows greater wear at well-defined localized areas than on the remainder of the rope, rope life can be extended (in cases where a reduced rope length is adequate) by cutting off a section at the worn end, and thus shifting the wear to different areas of the rope.

(5) Operating near electric power lines:

(a) Cranes shall be operated so that no part of the crane or load enters into the danger zone.

Exceptions: The danger zone may be entered if the electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work; or the danger zone may be entered if insulating barriers (not a part of nor an attachment to the crane) have been erected to prevent physical contact with the lines.

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load (including handling appendages) shall be 10 feet (3 m).

(ii) Caution shall be exercised when working near overhead lines because they can move horizontally or vertically due to wind, moving the danger zone to new positions.

(iii) While in transit with no load and boom lowered, the clearance shall be as specified in WAC 296-155-525 (3)(e).

(iv) A qualified signal person shall be assigned to observe the clearance when the crane moves to within a boom's length of the limits specified in WAC 296-155-525 (3)(e). The operator is not in the best position to judge distance between the power line and the crane or its protruberances.

(b) If cage-type boom guards, insulating links, or proximity warning devices are used on cranes, such devices shall not be a substitute for the requirements of WAC 296-155-525 (3)(e), even if such devices are required by law or regulation. In view of the complex, invisible, and lethal nature of the electrical hazard involved, and to lessen the potential of false security, limitations of such devices, if used, shall be understood by operating personnel and tested in the manner and intervals prescribed by the manufacturer of the device. Compliance with WAC 296-155-525 (3)(e) is the recommended practice of this regulation in determining permissible proximity of the crane and its protruberances, including load, to electrical power lines.

(c) Before the commencement of operations near electrical lines, the person responsible for the job shall notify the owners of the lines or their authorized representatives, provide them with all pertinent information, and request their cooperation.

(d) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities verify that it is not an energized line.

(e) Exceptions to this procedure, if approved by the owner of the electrical lines, may be granted by the administrative or regulatory authority if the alternate procedure provides protection and is set forth in writing.

(f) Durable signs shall be installed at the operator's station and on the outside of the crane warning that electrocution or serious bodily injury may occur unless a minimum clearance of 10 feet (3 m) is maintained between the crane or the load being handled and energized power lines. Greater clearances are required because of higher voltage as stated in WAC 296-155-525 (3)(e). These signs shall be revised when local jurisdiction requires greater clearances.

(6) Site preparation and erection.

(a) All load bearing foundations, supports, and rail tracks shall be constructed or installed to support the crane loads and to transmit them to the soil or other support

medium. In addition to supporting vertical load, foundations and supports, rail supports excepted, should be designed to provide a moment resisting overturning equal to a minimum of 150% of the maximum crane overturning moment.

(b) Rails should be level and straight, unless specifically designed for curves or grades, and properly spaced for the crane trucks in accordance with the manufacturer's specifications. The track and support system should have sufficient rigidity to limit dynamic oscillations and deviations from plumb.

(c) Rails shall be securely attached to the supporting surface in a manner capable of resisting the horizontal and vertical loads specified by the manufacturer. When applicable, provisions should be made for thermal expansion and contraction.

(d) Splices in rail tracks (bolted or welded) shall have smooth joints.

(e) When required, a designated portion of the track should be arranged and constructed as an out-of-service parking area complete with means needed for supporting the crane against storm wind effects and anchoring it against unwanted movement along the track; the parking track should be in place before erection commences.

(f) Rails shall be electrically grounded when they carry cranes electrically powered from an outside source.

(g) Both ends of all tracks shall be provided with stops or buffers adjusted for simultaneous contact with both sides of the travel base.

(h) When more than one crane will be operating on a run of track, particular consideration should be given to the number and disposition of parking areas.

(i) The hazard of earthquake effects appropriated to the site or zone should be considered.

(j) The crane manufacturer shall provide maximum resulting loads at the base of the crane, or wheel loads, for use in design of the supports.

(7) General erection requirements.

(a) When cranes are erected, the manufacturer's or a qualified person's written erection instructions and a list of the weights of each component to be erected shall be at the site.

(b) Cranes shall be erected in accordance with the crane manufacturer's or a qualified person's recommendations. Erection shall be performed under the supervision of a qualified person.

(c) Procedures shall be established before erection work commences to implement the erection instructions and to adapt them to the particular needs of the site. The need for temporary guying and bracing during erection shall be established.

(d) Before crane components are erected, they shall be visually inspected for damage. Damaged members shall not be erected until repaired in accordance with the manufacturer's or qualified person's instructions, or replaced.

(e) Slings and lifting accessories shall be selected and arranged to avoid damaging or marring crane members during erection.

(f) Wind velocity at the site at the time of erection should be considered as a limiting factor that could require suspending the erection operation.

(g) Crane towers shall be erected plumb to a tolerance that is specified by the manufacturer.

(h) Cranes required to weathervane when out-of-service shall be installed with clearance for the boom and superstructure to swing a full 360° arc without striking a fixed object or other crane.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-155-527, filed 8/9/95, effective 9/25/95.]

WAC 296-155-655 General protection requirements. (1) Surface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

(2) Underground installations.

(a) The location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be located prior to opening an excavation.

(b) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to locate the underground utility installation prior to the start of actual excavation.

(c) When excavation operations approach the location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

(d) While the excavation is open, underground installations shall be protected, supported, or removed as necessary to safeguard employees.

(3) Access and egress.

(a) Structural ramps.

(i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

(ii) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

(iii) Structural members used for ramps and runways shall be of uniform thickness.

(iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(b) Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

(4) Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

(5) Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging

equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with WAC 296-155-610 (2)(g), to provide adequate protection for the operator during loading and unloading operations.

(6) Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(7) Hazardous atmospheres.

(a) Testing and controls. In addition to the requirements set forth in parts B-1, C, and C-1 of this chapter (296-155 WAC) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with parts B-1 and C of this chapter respectively.

(iii) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(b) Emergency rescue equipment.

(i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

Note: See chapter 296-62 WAC, Part M for additional requirements applicable to confined space operations.

(8) Protection from hazards associated with water accumulation.

(a) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water

is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

(b) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

(c) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with subdivisions (a) and (b) of this subsection.

(9) Stability of adjacent structures.

(a) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(b) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(ii) The excavation is in stable rock; or

(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

(iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(c) Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

(10) Protection of employees from loose rock or soil.

(a) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

(b) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(11) Inspections.

(a) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(b) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(12) Fall protection.

(a) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with chapter 296-155 WAC, Part C-1 shall be provided where walkways are 4 feet or more above lower levels.

(b) Adequate barrier physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., shall be backfilled.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-655, filed 4/25/95, effective 10/1/95. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-655, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-655, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-655, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-655, filed 6/17/81; Order 76-29, § 296-155-655, filed 9/30/76; Order 74-26, § 296-155-655, filed 5/7/74, effective 6/6/74.]

WAC 296-155-682 Requirements for equipment and tools. (1) Bulk cement storage. Bulk storage bins, containers, and silos shall be equipped with the following:

(a) Conical or tapered bottoms; and

(b) Mechanical or pneumatic means of starting the flow of material.

(2) No employee shall be permitted to enter storage facilities unless the ejection system has been shut down and locked out in accordance with WAC 296-155-429.

(3) Safety belts, harnesses, lanyards, lifelines or droplines, independently attached or attended, shall be used as prescribed in chapter 296-155 WAC, Part C-1.

(4) Concrete mixers. Concrete mixers with one cubic yard (.8 m3) or larger loading skips shall be equipped with the following:

(a) A mechanical device to clear the skip of materials; and

(b) Guardrails installed on each side of the skip.

(5) Power concrete trowels. Powered and rotating type concrete troweling machines that are manually guided shall be equipped with a control switch that will automatically shut off the power whenever the hands of the operator are removed from the equipment handles.

(6) Concrete buggies. Concrete buggy handles shall not extend beyond the wheels on either side of the buggy.

Note: Installation of knuckle guards on buggy handles is recommended.

(7) Runways.

(a) Runways shall be constructed to carry the maximum contemplated load with a safety factor of four, have a smooth running surface, and be of sufficient width for two buggies to pass. Single runs to have a minimum width of forty-two inches with turnouts. Runways to have standard railings. Where motor driven concrete buggies are used, a minimum four-inches by four-inches wheel guard shall be securely fastened to outside edge of runways.

(b) All concrete buggy runways which are 12 inches or more above a work surface or floor, or ramps with more than 4 percent incline shall be considered "elevated" runways.

Exception: Small jobs utilizing only one concrete buggy, or larger jobs utilizing a "one-way traffic pattern" may be exempt from the requirements for "turnouts" or for "sufficient width for two buggies to pass."

Exemption: Runways less than 12 inches above the floor or ground which are utilized by hard-powered buggies only, may be exempt from the requirements for guardrails and wheelguards.

(8) Concrete pumping systems.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of pumpcrete or similar systems. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer, competent in this field, and such determinations will be appropriately documented and recorded.

(b) Rated load capacities, and recommended operating speeds and pressures, special hazard warnings, or instructions, shall be conspicuously posted on all equipment. Instructions and warnings shall be visible to the operator while at the control station.

(c) Concrete pumping systems using discharge pipes shall be provided with pipe supports designed for one hundred percent overload.

(d) Compressed air hoses used on concrete pumping systems shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized.

(e) No part of the concrete pumping system shall operate closer to high voltage electrical conductors than the distances specified in chapter 296-155 WAC, Part I.

(f) Hoses and/or pipes used to carry concrete under pressure shall be secured one to the other with an adequate length of at least 1/4 inch diameter chain or cable to prevent whipping in the event of an accidental separation of joints. All system safety pins shall be in place during pumping operations.

(g) The employer shall designate a competent person who shall inspect all machinery, equipment, and accessories prior to each use, and periodically during use, to make sure it is in safe operating conditions. Any deficiencies shall be repaired, or defective parts replaced before continued use.

(h) A thorough annual inspection of the equipment including nondestructive testing of all sections of the booms, by a method capable of ensuring the structural integrity of the material being tested shall be made. The inspection and testing shall be conducted by a competent person, or a

government or private agency recognized by the department. A record of the test results shall be maintained by the employer, and a copy shall be available in each unit for inspection by the department.

(i) All welding shall conform to AWS B3.0-41 Standard Qualification Procedure: AWS D8.4-61 Recommended Practices of Automotive Welding Design: or AWS D10.9-69 Standard Qualification of Welding Procedures and Welders for Piping and Tubing.

(j) Booms shall not be used for operations other than that for which they are designed.

(9) Concrete buckets.

(a) Concrete buckets equipped with hydraulic or pneumatic gates shall have positive safety latches or similar safety devices installed to prevent premature or accidental dumping.

(b) Concrete buckets shall be designed to prevent concrete from hanging up on top and the sides.

(c) Riding of concrete buckets for any purpose shall be prohibited, and vibrator crews shall be kept out from under concrete buckets suspended from cranes or cableways.

(d) When discharging on a slope, the wheels of ready-mix trucks shall be blocked and the brakes set to prevent movement.

(10) Tremies. Sections of tremies and similar concrete conveyances shall be secured with wire rope (or equivalent materials in addition to the regular couplings or connections).

(11) Bull floats. Bull float handles, used where they might contact energized electrical conductors, shall be constructed of nonconductive material or insulated with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.

(12) Masonry saws shall be constructed, guarded, and operated in accordance with WAC 296-155-367 (1) through (4).

(13) Lockout/tagout procedures. No employee shall be permitted to perform maintenance or repair activity on equipment (such as compressors, mixers, screens, or pumps used for concrete and masonry construction activities) where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been locked out and tagged in accordance with chapter 296-155 WAC, Part I.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-682, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-682, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-682, filed 1/10/91, effective 2/12/91; 90-17-051 (Order 90-10), § 296-155-682, filed 8/13/90, effective 9/24/90; 89-11-035 (Order 89-03), § 296-155-682, filed 5/15/89, effective 6/30/89.]

WAC 296-155-715 Bolting, riveting, fitting-up, and plumbing-up. (1) General requirements.

(a) Containers shall be provided for storing or carrying rivets, bolts, and drift pins, and secured against accidental displacement when aloft.

(b) Pneumatic hand tools shall be disconnected from the power source, and pressure in hose lines shall be released, before any adjustments or repairs are made.

(c) Air line hose sections shall be tied together except when quick disconnect couplers are used to join sections.

(d) Eye protection shall be provided in accordance with Part C of this chapter.

(2) Bolting.

(a) When bolts or drift pins are being knocked out, means shall be provided to keep them from falling.

(b) Impact wrenches shall be provided with a locking device for retaining the socket.

(3) Riveting.

(a) Riveting shall not be done in the vicinity of combustible material unless precautions are taken to prevent fire.

(b) When workers are below and rivet heads are knocked off or backed out, means shall be provided to keep the rivet heads from falling on such workers.

(c) A safety wire shall be properly installed on the snap and on the handle of the pneumatic riveting hammer and shall be used at all times. The wire size shall be not less than No. 9 (B & S gauge), leaving the handle and annealed No. 14 on the snap or equivalent.

(d) The rivet heating equipment shall be kept as near as possible to the riveting gang with whom the rivet heater is working.

(e) Hot rivets shall never be thrown across shaftways or towards the outside of a building.

(f) When riveting is done on an outside wall, the rivets shall be passed by hand or thrown parallel to the wall.

(g) Metal cone shaped buckets shall be used for catching hot rivets.

(h) Riveters shall avoid allowing the air hose to become wrapped or tangled around their legs.

(i) Empty bolt and rivet kegs shall be removed from the floor as soon as possible.

(j) Pails and hand lines shall be used when raising or lowering bolts, rivets or small tools.

(k) The nozzle of the riveting gun shall be periodically inspected and the wire attachment not allowed to become worn so as to permit the nozzle to fly out with the air pressure.

(l) Electric welding equipment shall not be used where wire rope is used to suspend scaffolds.

(4) Plumbing-up.

(a) Connections of the equipment used in plumbing-up shall be properly secured.

(b) The turnbuckles shall be secured to prevent unwinding while under stress.

(c) Plumbing-up guys related equipment shall be placed so that employees can get at the connection points.

(d) Plumbing-up guys shall be removed only under the supervision of a competent person.

(5) Wood planking shall be of proper thickness to carry the working load, but shall be not less than 2 inches thick full size undressed, exterior grade plywood, at least 3/4-inch thick, or equivalent material.

(6) Metal decking of sufficient strength shall be laid tight and secured to prevent movement.

(7) Planks shall overlap the bearing on each end by a minimum of 12 inches.

(8) Wire mesh, exterior plywood, or equivalent, shall be used around columns where planks do not fit tightly.

(9) Provisions shall be made to secure temporary flooring against displacement.

(10) All unused openings in floors, temporary or permanent, shall be completely planked over or guarded in accordance with Part C-1 of this chapter.

(11) Temporary bracing and/or guying shall be utilized to stabilize a structure until construction has been completed.

(12) Employees shall use safety belts in accordance with Part C-1 of this chapter when they are working on float scaffolds.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-715, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-715, filed 7/20/94, effective 9/20/94; Order 76-29, § 296-155-715, filed 9/30/76; Order 74-26, § 296-155-715, filed 5/7/74, effective 6/6/74.]

WAC 296-155-730 Tunnels and shafts. (1) Scope and application.

(a) This section applies to the construction of underground tunnels, shafts, chambers, and passageways. This section also applies to cut-and-cover excavations which are both physically connected to ongoing underground construction operations within the scope of this section, and covered in such a manner as to create conditions characteristic of underground construction.

(b) This section does not apply to excavation and trenching operations covered by Part N of this chapter, such as foundation operations for above-ground structures that are not physically connected to underground construction operations, and surface excavation.

(c) The employer shall comply with the requirements of this part and chapter in addition to applicable requirements of chapter 296-36 WAC, Safety standards—Compressed air work.

(2) Access and egress.

(a) Each operation shall have a check-in/check-out system that will provide positive identification of every employee underground. An accurate record of identification and location of the employees shall be kept on the surface. This procedure is not required when the construction of underground facilities designed for human occupancy has been sufficiently completed so that the permanent environmental controls are effective, and when the remaining construction activity will not cause any environmental hazard, or structural failure within the facilities.

(b) The employer shall provide and maintain safe means of access and egress to all work stations.

(c) The employer shall provide access and egress in such a manner that employees are protected from being struck by excavators, haulage machines, trains, and other mobile equipment.

(d) The employer shall control access to all openings to prevent unauthorized entry underground. Unused chutes, manways, or other openings shall be tightly covered, bulkheaded, or fenced off, and shall be posted with warning signs indicating "keep out" or similar language. Completed or unused sections of the underground facility shall be barricaded.

(3) Safety instruction. All employees shall be instructed in the recognition and avoidance of hazards associated with underground construction activities including, where appropriate, the following subjects:

(a) Air monitoring;

(b) Ventilation;

- (c) Confined space entry procedures;
- (d) Permit-required confined space entry procedures;
- (e) Illumination;
- (f) Communications;
- (g) Flood control;
- (h) Mechanical equipment;
- (i) Personal protective equipment;
- (j) Explosives;
- (k) Fire prevention and protection; and
- (l) Emergency procedures, including evacuation plans and check-in/check-out systems.

(4) Notification.

(a) Oncoming shifts shall be informed of any hazardous occurrences or conditions that have affected, or might affect employee safety, including liberation of gas, equipment failures, earth or rock slides, cave-ins, floodings, fire(s), or explosions.

(b) Information specified in (a) of this subsection shall be recorded in a shift journal which shall be current prior to the end of each shift, and shall be located aboveground.

(c) Oncoming supervisory personnel shall read the notification prior to going underground, and shall signify their understanding of the contents by affixing their respective initials to the log.

(d) The hazard notification log shall be retained on the site until the completion of the project.

(e) The employer shall establish and maintain direct communications for coordination of activities with other employers whose operations at the jobsite affect or may affect the safety of employees underground.

(5) Communications.

(a) When natural unassisted voice communication is ineffective, a power-assisted means of voice communication shall be used to provide communication between the work face, the bottom of the shaft, and the surface.

(b) Two effective means of communication, at least one of which shall be voice communication, shall be provided in all shafts which are being developed or used either for personnel access or for hoisting. Additional requirements for hoist operator communication are contained in subsection (22)(c)(xv) of this section.

(c) Powered communication systems shall operate on an independent power supply, and shall be installed so that the use of or disruption of any one phone or signal location will not disrupt the operation of the system from any other location.

(d) Communication systems shall be tested upon initial entry of each shift to the underground, and as often as necessary at later times, to ensure that they are in working order.

(e) Any employee working alone underground in a hazardous location, who is both out of the range of natural unassisted voice communication and not under observation by other persons, shall be provided with an effective means of obtaining assistance in an emergency.

(6) Emergency provisions. Hoisting capability. When a shaft is used as a means of egress, the employer shall make advance arrangements for power-assisted hoisting capability to be readily available in an emergency, unless the regular hoisting means can continue to function in the event of an electrical power failure at the jobsite. Such hoisting means shall be designed so that the load hoist drum is

powered in both directions of rotation and so that the brake is automatically applied upon power release or failure.

(7) Self-rescuers. The employer shall provide self-rescuers having current approval from the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration to be immediately available to all employees at work stations in underground areas where employees might be trapped by smoke or gas. The selection, issuance, use, and care of respirators shall be in accordance with the requirements of chapter 296-62 WAC, Part E.

(8) Designated person. At least one designated person shall be on duty aboveground whenever any employee is working underground. This designated person shall be responsible for securing immediate aid and keeping an accurate record of the number, identification, and location of employees who are underground in case of emergency. The designated person must not be so busy with other responsibilities that the personnel counting and identification function is encumbered.

(9) Emergency lighting. Each employee underground shall have an acceptable portable hand lamp or cap lamp in his or her work area for emergency use, unless natural light or an emergency lighting system provides adequate illumination for escape.

(10) Rescue teams.

(a) On jobsites where 25 or more employees work underground at one time, the employer shall provide (or make arrangements in advance with locally available rescue services to provide) at least two 5-person rescue teams, one on the jobsite or within one-half hour travel time from the entry point, and the other within 2 hours travel time.

(b) On jobsites where less than 25 employees work underground at one time, the employer shall provide (or make arrangements in advance with locally available rescue services to provide) at least one 5-person rescue team to be either on the jobsite or within one-half hour travel time from the entry point.

(c) Rescue team members shall be qualified in rescue procedures, the use and limitations of breathing apparatus, and the use of fire fighting equipment. Qualifications shall be reviewed not less than annually.

(d) On jobsites where flammable or noxious gases are encountered or anticipated in hazardous quantities, rescue team members shall practice donning and using pressure demand mode, self-contained breathing apparatuses monthly.

(e) The employer shall ensure that rescue teams are familiar with conditions at the jobsite.

(11) Hazardous classifications.

(a) Potentially gassy operations. Underground construction operations shall be classified as potentially gassy if either:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) \pm 0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for more than a 24-hour period; or

(ii) The history of the geographical area or geological formation indicates that 10 percent or more of the lower explosive limit for methane or other flammable gases is likely to be encountered in such underground operations.

(b) Gassy operations. Underground construction operations shall be classified as gassy if:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) \pm 0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for three consecutive days; or

(ii) There has been an ignition of methane or of other flammable gases emanating from the strata that indicates the presence of such gases; or

(iii) The underground construction operation is both connected to an underground work area which is currently classified as gassy and is also subject to a continuous course of air containing the flammable gas concentration.

(c) Declassification to potentially gassy operations. Underground construction gassy operations may be declassified to potentially gassy when air monitoring results remain under 10 percent of the lower explosive limit for methane or other flammable gases for three consecutive days.

(12) Gassy operations—Additional requirements. Only acceptable equipment, maintained in suitable condition, shall be used in gassy operations.

(a) Mobile diesel-powered equipment used in gassy operations shall be either approved in accordance with the requirements of 30 CFR Part 36 (formerly Schedule 31) by MSHA, or shall be demonstrated by the employer to be fully equivalent to such MSHA-approved equipment, and shall be operated in accordance with that part.

(b) Each entrance to a gassy operation shall be prominently posted with signs notifying all entrants of the gassy classification.

(c) Smoking shall be prohibited in all gassy operations and the employer shall be responsible for collecting all personal sources of ignition, such as matches and lighters, from all persons entering a gassy operation.

(d) A fire watch as described in chapter 296-155 WAC, Part H, shall be maintained when hot work is performed.

(e) Once an operation has met the criteria in subsection (11)(a)(i) of this section, warranting classification as gassy, all operations in the affected area, except the following, shall be discontinued until the operation either is in compliance with all of the gassy operation requirements or has been declassified in accordance with (c) of this subsection:

(i) Operations related to the control of the gas concentration;

(ii) Installation of new equipment, or conversion of existing equipment, to comply with this subsection; and

(iii) Installation of above-ground controls for reversing the air flow.

(13) Air quality and monitoring.

(a) General. Air quality limits and control requirements specified in chapter 296-62 WAC, Part H, shall apply except as modified by this subsection.

(b) The employer shall assign a competent person who shall perform all air monitoring required by this section.

(c) Where this section requires monitoring of airborne contaminants "as often as necessary," the competent person shall make a reasonable determination as to which substances to monitor and how frequently to monitor, considering at least the following factors:

(i) Location of jobsite: Proximity to fuel tanks, sewers, gas lines, old landfills, coal deposits, and swamps;

(ii) Geology: Geological studies of the jobsite, particularly involving the soil type and its permeability;

(iii) History: Presence of air contaminants in nearby jobsites, changes in levels of substances monitored on the prior shift; and

(iv) Work practices and jobsite conditions: The use of diesel engines, use of explosives, use of fuel gas, volume and flow of ventilation, visible atmospheric conditions, decompression of the atmosphere, welding, cutting and hot work, and employees' physical reactions to working underground.

(d) The employer shall provide testing and monitoring instruments which are capable of achieving compliance with the provisions of this subsection, and:

(i) Shall maintain the testing and monitoring instruments in good condition;

(ii) Shall calibrate the instruments on a frequency not to exceed 6 months.

(e) Exposure to airborne contaminants shall not exceed the levels established by chapter 296-62 WAC, Part H.

(f) Respirators shall not be substituted for environmental control measures. However, where environmental controls have not yet been developed, or when necessary by the nature of the work involved (for example, welding, sand blasting, lead burning), an employee may work for short periods of time in concentrations of airborne contaminants which exceed the limit of permissible exposure referred to in (d) of this subsection, if the employee wears a respiratory protective device approved by MSHA-NIOSH as protection against the particular hazards involved, and the selection and use of respirators complies with the provisions of chapter 296-62 WAC, Part E.

(g) Employees shall be withdrawn from areas in which there is a concentration of an airborne contaminant which exceeds the permissible exposure limit listed for that contaminant, except as modified in (t)(i) and (ii) of this subsection.

(h) The atmosphere in all underground work areas shall be tested as often as necessary to assure that the atmosphere at normal atmospheric pressure contains at least 19.5 percent oxygen and no more than 22 percent oxygen.

(i) Tests for oxygen content shall be made before tests for air contaminants.

(j) Field-type oxygen analyzers, or other suitable devices, shall be used to test for oxygen deficiency.

(k) The atmosphere in all underground work areas shall be tested quantitatively for carbon monoxide, nitrogen dioxide, hydrogen sulfide, and other toxic gases, dust, vapors, mists, and fumes as often as necessary to ensure that the permissible exposure limits prescribed in chapter 296-62 WAC, Part H, are not exceeded.

(l) The atmosphere in all underground work areas shall be tested quantitatively for methane and other flammable gases as often as necessary to determine:

(i) Whether action is to be taken under (q), (r), and (s) of this subsection; and

(ii) Whether an operation is to be classified potentially gassy or gassy under subsection (11) of this section.

(m) If diesel-engine or gasoline-engine driven ventilating fans or compressors are used, an initial test shall be made of the inlet air of the fan or compressor, with the

engines operating, to ensure that the air supply is not contaminated by engine exhaust.

(n) Testing shall be performed as often as necessary to ensure that the ventilation requirements of subsection (15) of this section are met.

(o) When rapid excavation machines are used, a continuous flammable gas monitor shall be operated at the face with the sensor(s) placed as high and close to the front of the machine's cutter head as practicable.

(p) Whenever air monitoring indicates the presence of 5 ppm or more of hydrogen sulfide, a test shall be conducted in the affected underground work area(s), at least at the beginning and midpoint of each shift, until the concentration of hydrogen sulfide has been less than 5 ppm for 3 consecutive days.

(i) Whenever hydrogen sulfide is detected in an amount exceeding 10 ppm, a continuous sampling and indicating hydrogen sulfide monitor shall be used to monitor the affected work area.

(ii) Employees shall be informed when a concentration of 10 ppm hydrogen sulfide is exceeded.

(iii) The continuous sampling and indicating hydrogen sulfide monitor shall be designed, installed, and maintained to provide a visual and aural alarm when the hydrogen sulfide concentration reaches 15 ppm to signal that additional measures, such as respirator use, increased ventilation, or evacuation, might be necessary to maintain hydrogen sulfide exposure below the permissible exposure limit.

(q) When the competent person determines, on the basis of air monitoring results or other information, that air contaminants may be present in sufficient quantity to be dangerous to life, the employer shall:

(i) Prominently post a notice at all entrances to the underground jobsite to inform all entrants of the hazardous condition; and

(ii) Immediately increase sampling frequency levels to insure workers are not exposed to identified contaminants in excess of the permissible exposure limit(s); and

(iii) Ensure that all necessary precautions are taken to comply with pertinent requirements of this section, and chapter 296-62 WAC.

(r) Whenever five percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return, steps shall be taken to increase ventilation air volume or otherwise control the gas concentration, unless the employer is operating in accordance with the potentially gassy or gassy operation requirements. Such additional ventilation controls may be discontinued when gas concentrations are reduced below five percent of the lower explosive limit, but shall be reinstituted whenever the five percent level is exceeded.

(s) Whenever 10 percent or more of the lower explosive limit for methane or other flammable gases is detected in the vicinity of welding, cutting, or other hot work, such work shall be suspended until the concentration of such flammable gas is reduced to less than 10 percent of the lower explosive limit.

(t) Whenever 20 percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return:

(i) All employees, except those necessary to eliminate the hazard, shall be immediately withdrawn to a safe location above ground; and

(ii) Employees who remain underground to correct or eliminate the hazard described in (t) above shall be equipped with approved, pressure demand mode, self-contained breathing apparatus, and shall have received adequate training in the proper use of that equipment.

(iii) Electrical power, except for acceptable pumping and ventilation equipment, shall be cut off to the area endangered by the flammable gas until the concentration of such gas is reduced to less than 20 percent of the lower explosive limit.

(14) Additional monitoring for potentially gassy and gassy operations. Operations which meet the criteria for potentially gassy and gassy operations set forth in subsection (13) of this section shall be subject to the additional monitoring requirements of this subsection.

(a) A test for oxygen content shall be conducted in the affected underground work areas and work areas immediately adjacent to such areas at least at the beginning and midpoint of each shift.

(b) When using rapid excavation machines, continuous automatic flammable gas monitoring equipment shall be used to monitor the air at the heading, on the rib, and in the return air duct. The continuous monitor shall signal the heading, and shut down electric power in the affected underground work area, except for acceptable pumping and ventilation equipment, when 20 percent or more of the lower explosive limit for methane or other flammable gases is encountered.

(i) A manual flammable gas monitor shall be used as needed, but at least at the beginning and midpoint of each shift, to ensure that the limits prescribed in subsections (11) and (13) of this section are not exceeded. In addition, a manual electrical shut down control shall be provided near the heading.

(ii) Local gas tests shall be made prior to and continuously during any welding, cutting, or other hot work.

(iii) In underground operations driven by drill-and-blast methods, the air in the affected area shall be tested for flammable gas prior to re-entry after blasting, and continuously when employees are working underground.

(c) Recordkeeping. A record of all air quality tests shall be maintained above ground at the worksite and be made available to the director or his/her representatives upon request. The record shall include the location, date, time, substance and amount monitored. Records of exposures to toxic substances shall be retained in accordance with Part B, chapter 296-62 WAC. All other air quality test records shall be retained until completion of the project.

(15) Ventilation.

(a)(i) Fresh air shall be supplied to all underground work areas in sufficient quantities to prevent dangerous or harmful accumulation of dust, fumes, mists, vapors, or gases.

(ii) Mechanical ventilation shall be provided in all underground work areas except when the employer can demonstrate that natural ventilation provides the necessary air quality through sufficient air volume and air flow.

(b) A minimum of 200 cubic feet (5.7 m³) of fresh air per minute shall be supplied for each employee underground.

(c) The linear velocity of air flow in the tunnel bore, in shafts, and in all other underground work areas shall be at

least 30 feet (9.15 m) per minute where blasting or rock drilling is conducted, or where other conditions likely to produce dust, fumes, mists, vapors, or gases in harmful or explosive quantities are present.

(d) The direction of mechanical air flow shall be reversible.

(e) Air that has passed through underground oil or fuel-storage areas shall not be used to ventilate working areas.

(f) Following blasting, ventilation systems shall exhaust smoke and fumes to the outside atmosphere before work is resumed in affected areas.

(g) Ventilation doors shall be designed and installed so that they remain closed when in use, regardless of the direction of the air flow.

(h) When ventilation has been reduced to the extent that hazardous levels of methane or flammable gas may have accumulated, a competent person shall test all affected areas after ventilation has been restored and shall determine whether the atmosphere is within flammable limits before any power, other than for acceptable equipment, is restored or work is resumed.

(i) Whenever the ventilation system has been shut down with all employees out of the underground area, only competent persons authorized to test for air contaminants shall be allowed underground until the ventilation has been restored and all affected areas have been tested for air contaminants and declared safe.

(j) When drilling rock or concrete, appropriate dust control measures shall be taken to maintain dust levels within limits set in chapter 296-155 WAC, Part B-1. Such measures may include, but are not limited to, wet drilling, the use of vacuum collectors, and water mix spray systems.

(k)(i) Internal combustion engines, except diesel-powered engines on mobile equipment, are prohibited underground.

(ii) Mobile diesel-powered equipment used underground in atmospheres other than gassy operations shall be either approved by MSHA in accordance with the provisions of 30 CFR Part 32 (formerly Schedule 24), or shall be demonstrated by the employer to be fully equivalent to such MSHA-approved equipment, and shall be operated in accordance with that Part. (Each brake horsepower of a diesel engine requires at least 100 cubic feet (28.32 m³) of air per minute for suitable operation in addition to the air requirements for personnel. Some engines may require a greater amount of air to ensure that the allowable levels of carbon monoxide, nitric oxide, and nitrogen dioxide are not exceeded.)

(iii) Application shall be made to the mining/explosives section, department of labor and industries, for permission to use specified diesel equipment in a specified underground area and shall include the following:

(A) The type of construction and complete identification data and specifications including analysis of the undiluted exhaust gases of the diesel equipment.

(B) The location where the diesel equipment is to be used.

(C) Before the diesel equipment is taken underground, written permission shall be obtained from the department of labor and industries or its duly authorized representative. A satisfactory test on surface, to show that the exhaust gases

do not exceed the maximum percentage of carbon monoxide permitted, shall be required.

(D) Diesel equipment shall only be used underground where the ventilation is controlled by mechanical means and shall not be operated if the ventilating current is less than 100 CFM per horsepower based on the maximum brake horsepower of the engines.

(E) Air measurements shall be made at least once daily in the diesel engine working area and the measurements entered in the Underground Diesel Engine Record Book. Permissible maximum amounts of noxious gases are as follows:

At engine exhaust ports	Carbon Monoxide	.10%	1,000 ppm ³
Next to equipment	Carbon Monoxide	.0035%	35 ppm
General atmosphere	Carbon Monoxide	.0035%	35 ppm
General atmosphere	Nitrogen Dioxide	.0001%	1 ppm
General atmosphere	Aldehydes	.0002%	2 ppm

³ Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 mm Hg. pressure.

(l) Potentially gassy or gassy operations shall have ventilation systems installed which shall:

(i) Be constructed of fire-resistant materials; and

(ii) Have acceptable electrical systems, including fan motors.

(m) Gassy operations shall be provided with controls located aboveground for reversing the air flow of ventilation systems.

(n) In potentially gassy or gassy operations, wherever mine-type ventilation systems using an offset main fan installed on the surface are used, they shall be equipped with explosion-doors or a weak-wall having an area at least equivalent to the cross-sectional area of the airway.

(16) Illumination.

(a) Sufficient lighting shall be provided, in accordance with the requirements of chapter 296-155 WAC, Part B-1, to permit safe operations at the face as well as in the general tunnel or shaft area and at the employees' workplace.

(b) Only acceptable portable lighting shall be used within 50 feet (15.24 m) of any underground heading during explosive handling.

(17) Fire prevention and control. Fire prevention and protection requirements applicable to underground construction operations are found in Part D of this chapter except as modified by the following additional standards.

(a) Open flames and fires are prohibited in all underground construction operations except as permitted for welding, cutting, and other hot work operations.

(i) Smoking may be allowed only in areas free of fire and explosion hazards.

(ii) Readily visible signs prohibiting smoking and open flames shall be posted in areas having fire or explosion hazards.

(iii) The carrying of matches, lighters, or other flame-producing smoking materials shall be prohibited in all underground operations where fire or explosion hazards exist.

(b) The employer may store underground no more than a 24-hour supply of diesel fuel for the underground equipment used at the worksite.

(c) The piping of diesel fuel from the surface to an underground location is permitted only if:

(i) Diesel fuel is contained at the surface in a tank whose maximum capacity is no more than the amount of fuel required to supply for a 24-hour period the equipment serviced by the underground fueling station; and

(ii) The surface tank is connected to the underground fueling station by an acceptable pipe or hose system that is controlled at the surface by a valve, and at the shaft bottom by a hose nozzle; and

(iii) The pipe is empty at all times except when transferring diesel fuel from the surface tank to a piece of equipment in use underground; and

(iv) Hoisting operations in the shaft are suspended during refueling operations if the supply piping in the shaft is not protected from damage.

(d)(i) Gasoline shall not be carried, stored, or used underground.

(ii) Acetylene, liquefied petroleum gas, and methylacetylene propadiene stabilized gas may be used underground only for welding, cutting and other hot work, and only in accordance with Part H of this chapter and subsections (13), (15), (17), and (18) of this section.

(e) Oil, grease, and diesel fuel stored underground shall be kept in tightly sealed containers in fire-resistant areas at least 300 feet (91.44 m) from underground explosive magazines, and at least 100 feet (30.48 m) from shaft stations and steeply inclined passageways. Storage areas shall be positioned or diked so that the contents of ruptured or overturned containers will not flow from the storage area.

(f) Flammable or combustible materials shall not be stored above ground within 100 feet (30.48 m) of any access opening to any underground operation. Where this is not feasible because of space limitations at the jobsite, such materials may be located within the 100-foot limit, provided that:

(i) They are located as far as practicable from the opening; and

(ii) Either a fire-resistant barrier of not less than one-hour rating is placed between the stored material and the opening, or additional precautions are taken which will protect the materials from ignition sources.

(g) Fire-resistant hydraulic fluids shall be used in hydraulically-actuated underground machinery and equipment unless such equipment is protected by a fire suppression system or by multipurpose fire extinguisher(s) rated at a sufficient capacity for the type and size of hydraulic equipment involved, but rated at least 4A:4OB:C.

(h)(i) Electrical installations in underground areas where oil, grease, or diesel fuel are stored shall be used only for lighting fixtures.

(ii) Lighting fixtures in storage areas, or within 25 feet (7.62 m) of underground areas where oil, grease, or diesel fuel are stored, shall be approved for Class I, Division 2 locations, in accordance with Part I of this chapter.

(i) Leaks and spills of flammable or combustible fluids shall be cleaned up immediately.

(j) A fire extinguisher of at least 4A:4OB:C rating or other equivalent extinguishing means shall be provided at the head pulley and at the tail pulley of underground belt conveyors, and at 300-foot intervals along the belt.

(k) Any structure located underground or within 100 feet (30.48 m) of an opening to the underground shall be

constructed of material having a fire-resistance rating of at least one hour.

(18) Welding, cutting, and other hot work. In addition to the requirements of Part H of this chapter, the following requirements shall apply to underground welding, cutting, and other hot work.

(a) No more than the amount of fuel gas and oxygen cylinders necessary to perform welding, cutting, or other hot work during the next 24-hour period shall be permitted underground.

(b) Noncombustible barriers shall be installed below welding, cutting, or other hot work being done in or over a shaft or raise.

(19) Ground support.

(a) In tunnels (other than hard rock) timber sets, steel rings, steel frames, concrete liners, or other engineered tunnel support systems shall be used. Every tunnel support system shall be designed by a licensed professional engineer. Design specifications shall be available at the worksite.

(b) Portal areas. Portal openings and access areas shall be guarded by shoring, fencing, head walls, shotcreting, or other equivalent protection to ensure safe access of employees and equipment. Adjacent areas shall be scaled or otherwise secured to prevent loose soil, rock, or fractured materials from endangering the portal and access area.

(c) Subsidence areas. The employer shall ensure ground stability in hazardous subsidence areas by shoring, by filling in, or by erecting barricades and posting warning signs to prevent entry.

(d) Underground areas.

(i)(A) A competent person shall inspect the roof, face, and walls of the work area at the start of each shift and as often as necessary to determine ground stability.

(B) Competent persons conducting such inspections shall be protected from loose ground by location, ground support, or equivalent means.

(ii) Ground conditions along haulageways and travelways shall be inspected as frequently as necessary to ensure safe passage.

(iii) Loose ground that might be hazardous to employees shall be taken down, scaled, or supported.

(iv) Torque wrenches shall be used wherever bolts that depend on torsionally applied force are used for ground support.

(v) A competent person shall determine whether rock bolts meet the necessary torque, and shall determine the testing frequency in light of the bolt system, ground conditions, and the distance from vibration sources.

(vi) Suitable protection shall be provided for employees exposed to the hazard of loose ground while installing ground support systems.

(vii) Support sets shall be installed so that the bottoms have sufficient anchorage to prevent ground pressures from dislodging the support base of the sets. Lateral bracing (collar bracing, tie rods, or spreaders) shall be provided between immediately adjacent sets to ensure added stability.

(viii) Damaged or dislodged ground supports that create a hazardous condition shall be promptly repaired or replaced. When replacing supports, the new supports shall be installed before the damaged supports are removed.

(ix) A shield or other type of support shall be used to maintain a safe travelway for employees working in dead-end areas ahead of any support replacement operation.

(e) Shafts.

(i) Shafts and wells over 4 feet (1.219 m) in depth that employees must enter shall be supported by a steel casing, concrete pipe, timber, solid rock, or other suitable material.

(ii)(A) The full depth of the shaft shall be supported by casing or bracing except where the shaft penetrates into solid rock having characteristics that will not change as a result of exposure. Where the shaft passes through earth into solid rock, or through solid rock into earth, and where there is potential for shear, the casing or bracing shall extend at least 5 feet (1.53 m) into the solid rock. When the shaft terminates in solid rock, the casing or bracing shall extend to the end of the shaft or 5 feet (1.53 m) into the solid rock, whichever is less.

(B) The casing or bracing shall extend 42 inches (1.07 m) plus or minus 3 inches (8 cm) above ground level, except that the minimum casing height may be reduced to 12 inches (0.3 m), provided that a standard railing is installed; that the ground adjacent to the top of the shaft is sloped away from the shaft collar to prevent entry of liquids; and that effective barriers are used to prevent mobile equipment operating near the shaft from jumping over the 12-inch (0.3 m) barrier.

(iii) After blasting operations in shafts, a competent person shall determine if the walls, ladders, timbers, blocking, or wedges have loosened. If so, necessary repairs shall be made before employees other than those assigned to make the repairs are allowed in or below the affected areas.

(f) Blasting. This subsection applies in addition to the requirements for blasting and explosives operations, including handling of misfires, which are found in chapter 296-52 WAC.

(i) Blasting wires shall be kept clear of electrical lines, pipes, rails, and other conductive material, excluding earth, to prevent explosives initiation or employee exposure to electric current.

(ii) Following blasting, an employee shall not enter a work area until the air quality meets the requirements of subsection (13) of this section.

(g) Drilling.

(i) A competent person shall inspect all drilling and associated equipment prior to each use. Equipment defects affecting safety shall be corrected before the equipment is used.

(ii) The drilling area shall be inspected for hazards before the drilling operation is started.

(iii) Employees shall not be allowed on a drill mast while the drill bit is in operation or the drill machine is being moved.

(iv) When a drill machine is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured and the mast shall be placed in a safe position.

(v) Receptacles or racks shall be provided for storing drill steel located on jumbos.

(vi) Employees working below jumbo decks shall be warned whenever drilling is about to begin.

(vii) Drills on columns shall be anchored firmly before starting drilling, and shall be retightened as necessary thereafter.

(viii) The employer shall provide mechanical means on the top deck of a jumbo for lifting unwieldy or heavy material.

(ix) When jumbo decks are over 10 feet (3.05 m) in height, the employer shall install stairs wide enough for two persons.

(x) Jumbo decks more than 10 feet (3.05 m) in height shall be equipped with guardrails on all open sides, excluding access openings of platforms, unless an adjacent surface provides equivalent fall protection.

(xi) Only employees assisting the operator shall be allowed to ride on jumbos, unless the jumbo meets the requirements of subsection (20)(e) of this section.

(xii) Jumbos shall be chocked to prevent movement while employees are working on them.

(xiii) Walking and working surfaces of jumbos shall be maintained to prevent the hazards of slipping, tripping, and falling.

(xiv) Jumbo decks and stair treads shall be designed to be slip-resistant and secured to prevent accidental displacement.

(xv) Scaling bars shall be available at scaling operations and shall be maintained in good condition at all times. Blunted or severely worn bars shall not be used.

(xvi) Before commencing the drill cycle, the face and lifters shall be examined for misfires (residual explosives) and, if found, they shall be removed before drilling commences at the face. Blasting holes shall not be drilled through blasted rock (muck) or water.

(xvii) Employees in a shaft shall be protected either by location or by suitable barrier(s) if powered mechanical loading equipment is used to remove muck containing unfired explosives.

(xviii) A caution sign reading "buried line," or similar wording shall be posted where air lines are buried or otherwise hidden by water or debris.

(20) Haulage.

(a) A competent person shall inspect haulage equipment before each shift.

(i) Equipment defects affecting safety and health shall be corrected before the equipment is used.

(ii) Powered mobile haulage equipment shall be provided with adequate brakes.

(iii) Power mobile haulage equipment, including trains, shall have audible warning devices to warn employees to stay clear. The operator shall sound the warning device before moving the equipment and whenever necessary during travel.

(iv) The operator shall assure that lights which are visible to employees at both ends of any mobile equipment, including a train, are turned on whenever the equipment is operating.

(v) In those cabs where glazing is used, the glass shall be safety glass, or its equivalent, and shall be maintained and cleaned so that vision is not obstructed.

(b) Antirollback devices or brakes shall be installed on inclined conveyor drive units to prevent conveyors from inadvertently running in reverse. Employees shall not be

permitted to ride a power-driven chain, belt, or bucket conveyor unless the conveyor is specifically designed for the transportation of persons.

(c) Endless belt-type manlifts are prohibited in underground construction.

(d) General requirements also applicable to underground construction for use of conveyors in construction are found in chapter 296-155 WAC, Part L.

(e) No employee shall ride haulage equipment unless it is equipped with seating for each passenger and protects passengers from being struck, crushed, or caught between other equipment or surfaces. Members of train crews may ride on a locomotive if it is equipped with handholds and nonslip steps or footboards. Requirements applicable to underground construction for motor vehicle transportation of employees are found in chapter 296-155 WAC, Part M.

(f) Conveyor lockout.

(i) Conveyors shall be de-energized and locked out with a padlock, and tagged out with a "Do Not Operate" tag at any time repair, maintenance, or clean-up work is being performed on the conveyor.

(ii) Tags or push button stops are not acceptable.

(iii) Persons shall not be allowed to walk on conveyors except for emergency purposes and then only after the conveyor has been deenergized and locked out in accordance with (f) above, and persons can do so safely.

(g) Powered mobile haulage equipment, including trains, shall not be left unattended unless the master switch or motor is turned off; operating controls are in neutral or park position; and the brakes are set, or equivalent precautions are taken to prevent rolling.

(h) Whenever rails serve as a return for a trolley circuit, both rails shall be bonded at every joint and crossbonded every 200 feet (60.96 m).

(i) When dumping cars by hand, the car dumps shall have tiedown chains, bumper blocks, or other locking or holding devices to prevent the cars from overturning.

(j) Rocker-bottom or bottom-dump cars shall be equipped with positive locking devices to prevent unintended dumping.

(k) Equipment to be hauled shall be loaded and secured to prevent sliding or dislodgement.

(l)(i) Mobile equipment, including rail-mounted equipment, shall be stopped for manual connecting or service work, and;

(ii) Employees shall not reach between moving cars during coupling operations.

(iii) Couplings shall not be aligned, shifted, or cleaned on moving cars or locomotives.

(iv) Safety chains or other connections shall be used in addition to couplers to connect person cars or powder cars whenever the locomotive is uphill of the cars.

(v) When the grade exceeds one percent and there is a potential for runaway cars, safety chains or other connections shall be used in addition to couplers to connect haulage cars or, as an alternative, the locomotive must be downhill of the train.

(vi) Such safety chains or other connections shall be capable of maintaining connection between cars in the event of either coupler disconnect, failure or breakage.

(m) Parked rail equipment shall be chocked, blocked, or have brakes set to prevent inadvertent movement.

(n) Berms, bumper blocks, safety hooks, or equivalent means shall be provided to prevent overtravel and overturning of haulage equipment at dumping locations.

(o) Bumper blocks or equivalent stopping devices shall be provided at all track dead ends.

(p)(i) Only small handtools, lunch pails, or similar small items may be transported with employees in person cars, or on top of a locomotive.

(ii) When small hand tools or other small items are carried on top of a locomotive, the top shall be designed or modified to retain them while traveling.

(q)(i) Where switching facilities are available, occupied personnel cars shall be pulled, not pushed. If personnel cars must be pushed and visibility of the track ahead is hampered, then a qualified person shall be stationed in the lead car to give signals to the locomotive operator.

(ii) Crew trips shall consist of personnel loads only.

(21) Electrical safety. This subsection applies in addition to the general requirements for electrical safety which are found in Part I of this chapter.

(a) Electric power lines shall be insulated or located away from water lines, telephone lines, air lines, or other conductive materials so that a damaged circuit will not energize the other systems.

(b) Lighting circuits shall be located so that movement of personnel or equipment will not damage the circuits or disrupt service.

(c) Oil-filled transformers shall not be used underground unless they are located in a fire-resistant enclosure suitably vented to the outside and surrounded by a dike to retain the contents of the transformers in the event of rupture.

(22) Hoisting unique to underground construction except as modified by this section, the following provisions of chapter 296-155 WAC, Part L apply: Requirements for cranes are found in WAC 296-155-525. WAC 296-155-48533 contains rules applicable to crane hoisting of personnel, except, that the limitations imposed by WAC 296-155-48533(2) do not apply to the routine access of employees to the underground via a shaft. Requirements for personnel hoists, material hoists, and elevators are found in WAC 296-155-530 and in this subsection.

(a) General requirements for cranes and hoists.

(i) Materials, tools, and supplies being raised or lowered, whether within a cage or otherwise, shall be secured or stacked in a manner to prevent the load from shifting, snagging, or falling into the shaft.

(ii) A warning light suitably located to warn employees at the shaft bottom and subsurface shaft entrances shall flash whenever a load is above the shaft bottom or subsurface entrances, or the load is being moved in the shaft. This subsection does not apply to fully enclosed hoistways.

(iii) Whenever a hoistway is not fully enclosed and employees are at the shaft bottom, conveyances or equipment shall be stopped at least 15 feet (4.57 m) above the bottom of the shaft and held there until the signalperson at the bottom of the shaft directs the operator to continue lowering the load, except that the load may be lowered without stopping if the load or conveyance is within full view of a bottom signalperson who is in constant voice communication with the operator.

(iv)(A) Before maintenance, repairs, or other work is commenced in the shaft served by a cage, skip, or bucket,

the operator and other employees in the area shall be informed and given suitable instructions.

(B) A sign warning that work is being done in the shaft shall be installed at the shaft collar, at the operator's station, and at each underground landing.

(v) Any connection between the hoisting rope and the cage or skip shall be compatible with the type of wire rope used for hoisting.

(vi) Spin-type connections, where used, shall be maintained in a clean condition and protected from foreign matter that could affect their operation.

(vii) Cage, skip, and load connections to the hoist rope shall be made so that the force of the hoist pull, vibration, misalignment, release of lift force, or impact will not disengage the connection. Only closed shackles shall be used for cage and skip rigging.

(viii) When using wire rope wedge sockets, means shall be provided to prevent wedge escapement and to ensure that the wedge is properly seated.

(b) Additional requirements for cranes. Cranes shall be equipped with a limit switch to prevent overtravel at the boom tip. Limit switches are to be used only to limit travel of loads when operational controls malfunction and shall not be used as a substitute for other operational controls.

(c) Additional requirements for hoists.

(i) Hoists shall be designed so that the load hoist drum is powered in both directions of rotation, and so that brakes are automatically applied upon power release or failure.

(ii) Control levers shall be of the "deadman type" which return automatically to their center (neutral) position upon release.

(iii) When a hoist is used for both personnel hoisting and material hoisting, load and speed ratings for personnel and for materials shall be assigned to the equipment.

(iv) Hoist machines with cast metal parts shall not be used.

(v) Material hoisting may be performed at speeds higher than the rated speed for personnel hoisting if the hoist and components have been designed for such higher speeds and if shaft conditions permit.

(vi) Employees shall not ride on top of any cage, skip, or bucket except when necessary to perform inspection or maintenance of the hoisting system, in which case they shall be protected by a body belt/harness system to prevent falling.

(vii) Personnel and materials (other than small tools and supplies secured in a manner that will not create a hazard to employees) shall not be hoisted together in the same conveyance. However, if the operator is protected from the shifting of materials, then the operator may ride with materials in cages or skips which are designed to be controlled by an operator within the cage or skip.

(viii) Line speed shall not exceed the design limitations of the systems.

(ix) Hoists shall be equipped with landing level indicators at the operator's station. Marking of the hoist rope does not satisfy this requirement.

(x) Whenever glazing is used in the hoist house, it shall be safety glass, or its equivalent, and be free of distortions and obstructions.

(xi) A fire extinguisher that is rated at least 2A:10B:C (multipurpose, dry chemical) shall be mounted in each hoist house.

(xii) Hoist controls shall be arranged so that the operator can perform all operating cycle functions and reach the emergency power cutoff without having to reach beyond the operator's normal operating position.

(xiii) Hoists shall be equipped with limit switches to prevent overtravel at the top and bottom of the hoistway.

(xiv) Limit switches are to be used only to limit travel of loads when operational controls malfunction and shall not be used as a substitute for other operational controls.

(xv) Hoist operators shall be provided with a closed-circuit voice communication system to each landing station, with speaker-microphones so located that the operator can communicate with individual landing stations during hoist use.

(xvi) When sinking shafts 75 feet (22.86 m) or less in depth, cages, skips, and buckets that may swing, bump, or snag against shaft sides or other structural protrusions shall be guided by fenders, rails, ropes, or a combination of those means.

(xvii) When sinking shafts more than 75 feet (22.86 m) in depth, all cages, skips, and buckets shall be rope or rail-guided to within a rail length from the sinking operation.

(xviii) Cages, skips, and buckets in all completed shafts, or in all shafts being used as completed shafts, shall be rope or rail-guided for the full length of their travel.

(xix) Wire rope used in load lines of material hoists shall be capable of supporting, without failure, at least five times the maximum intended load or the factor recommended by the rope manufacturer, whichever is greater. Refer to chapter 296-155 WAC, Part L, for design factors for wire rope used in personnel hoists. The design factors shall be calculated by dividing the breaking strength of wire rope, as reported in the manufacturer's rating tables, by the total static load, including the weight of the wire rope in the shaft when fully extended.

(xx) A competent person shall visually check all hoisting machinery, equipment, anchorages, and hoisting rope at the beginning of each shift and during hoist use, as necessary.

(xxi) Each safety device shall be checked by a competent person at least weekly during hoist use to ensure suitable operation and safe condition.

(xxii) In order to ensure suitable operation and safe condition of all functions and safety devices, each hoist assembly shall be inspected and load-tested to 100 percent of its rated capacity: At the time of installation; after any repairs or alterations affecting its structural integrity; after the operation of any safety device; and annually when in use. The employer shall prepare a certification record which includes the date each inspection and load-test was performed; the signature of the person who performed the inspection and test; and a serial number or other identifier for the hoist that was inspected and tested. The most recent certification record shall be maintained on file until completion of the project.

(xxiii) Before hoisting personnel or material, the operator shall perform a test run of any cage or skip whenever it has been out of service for one complete shift, and

whenever the assembly or components have been repaired or adjusted.

(xiv) Unsafe conditions shall be corrected before using the equipment.

(d) Additional requirements for personnel hoists.

(i) Hoist drum systems shall be equipped with at least two means of stopping the load, each of which shall be capable of stopping and holding 150 percent of the hoist's rated line pull. A broken-rope safety, safety catch, or arrestment device is not a permissible means of stopping under this subsection.

(ii) The operator shall remain within sight and sound of the signals at the operator's station.

(iii) All sides of personnel cages shall be enclosed by one-half inch (12.70 mm) wire mesh (not less than No. 14 gauge or equivalent) to a height of not less than 6 feet (1.83 m). However, when the cage or skip is being used as a work platform, its sides may be reduced in height to 42 inches (1.07 m) when the conveyance is not in motion.

(iv) All personnel cages shall be provided with a positive locking door that does not open outward.

(v) All personnel cages shall be provided with a protective canopy. The canopy shall be made of steel plate, at least 3/16 -inch (4.763 mm) in thickness, or material of equivalent strength and impact resistance. The canopy shall be sloped to the outside, and so designed that a section may be readily pushed upward to afford emergency egress. The canopy shall cover the top in such a manner as to protect those inside from objects falling in the shaft.

(vi) Personnel platforms operating on guide rails or guide ropes shall be equipped with broken-rope safety devices, safety catches, or arrestment devices that will stop and hold 150 percent of the weight of the personnel platform and its maximum rated load.

(vii) During sinking operations in shafts where guides and safeties are not yet used, the travel speed of the personnel platform shall not exceed 200 feet (60.96 m) per minute. Governor controls set for 200 feet (60.96 m) per minute shall be installed in the control system and shall be used during personnel hoisting.

(viii) The personnel platform may travel over the controlled length of the hoistway at rated speeds up to 600 feet (182.88 m) per minute during sinking operations in shafts where guides and safeties are used.

(ix) The personnel platform may travel at rated speeds greater than 600 feet (182.88 m) per minute in complete shafts.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-730, filed 1/18/95, effective 3/1/95; 94-15-096 (Order 94-07), § 296-155-730, filed 7/20/94, effective 9/20/94; 91-11-070 (Order 91-01), § 296-155-730, filed 5/20/91, effective 6/20/91; 90-03-029 (Order 89-20), § 296-155-730, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-730, filed 1/21/86; Order 76-29, § 296-155-730, filed 9/30/76; Order 74-26, § 296-155-730, filed 5/7/74, effective 6/6/74.]

WAC 296-155-740 Cofferdams. (1) If overtopping of the cofferdam by high waters is possible, means shall be provided for controlled flooding of the work area.

(2) Warning signals for evacuation of employees in case of emergency shall be developed and posted.

(3) Cofferdam walkways, bridges, or ramps with at least two means of rapid exit, shall be provided with guardrails as specified in Part C-1 of this chapter.

(4) Manways and ladderways shall be installed separately from the hoistways and partitioned off to prevent hoisted materials from protruding into or falling into manways and/or ladderways.

(5) Pumping equipment shall be located on substantially constructed platforms and where installed in such a position that persons must work below, toe boards shall be installed on the platform.

(6) Cofferdams located close to navigable shipping channels shall be protected from vessels in transit, where possible.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-740, filed 4/25/95, effective 10/1/95; Order 74-26, § 296-155-740, filed 5/7/74, effective 6/6/74.]

WAC 296-155-745 Compressed air. (1) General provisions.

(a) There shall be present, at all times, at least one competent person designated by and representing the employer, who shall be familiar with this part in all respects and responsible for full compliance with these and other applicable parts.

(b) Every employee shall be instructed in the rules and regulations which concern their safety or the safety of others.

(2) Medical attendance, examination, and regulations.

(a) There shall be retained one or more licensed physicians familiar with and experienced in the physical requirements and the medical aspects of compressed air work and the treatment of decompression illness. They shall be available at all times while work is in progress in order to provide medical supervision of employees employed in compressed air work. They shall be physically qualified and be willing to enter a pressurized environment.

(b) No employee shall be permitted to enter a compressed air environment until they have been examined by the physician and reported to be physically qualified to engage in such work.

(c) In the event an employee is absent from work for 10 days, or is absent due to sickness or injury, they shall not resume work until they are reexamined by the physician, and their physical condition reported, as provided in this subsection, to be such as to permit them to work in compressed air.

(d) After an employee has been employed continuously in compressed air for a period designated by the physician, but not to exceed 1 year, the employee shall be reexamined by the physician to determine if they are still physically qualified to engage in compressed air work.

(e) Such physician shall at all times keep a complete and full record of examinations made by themselves. The physician shall also keep an accurate record of any decompression illness or other illness or injury incapacitating any employee for work, and of all loss of life that occurs in the operation of a tunnel, caisson, or other compartment in which compressed air is used.

(f) Records shall be available for the inspection by the director or his/her representatives, and a copy thereof shall be forwarded to the department within 48 hours following the occurrence of the accident, death, injury, or decompression.

sion illness. It shall state as fully as possible the cause of said death or decompression illness, and the place where the injured or sick employee was taken, and such other relative information as may be required by the director.

(g) A fully equipped first-aid station shall be provided at each tunnel project regardless of the number of persons employed. An ambulance or transportation suitable for a litter case shall be at each project.

(h) Where tunnels are being excavated from portals more than 5 road miles apart, a first-aid station and transportation facilities shall be provided at each portal.

(i) A medical lock shall be established and maintained in immediate working order whenever air pressure in the working chamber is increased above the normal atmosphere.

(j) The medical lock shall:

(i) Have at least 6 feet of clear headroom at the center, and be subdivided into not less than two compartments;

(ii) Be readily accessible to employees working under compressed air;

(iii) Be kept ready for immediate use for at least 5 hours subsequent to the emergence of any employee from the working chamber;

(iv) Be properly heated, lighted and ventilated;

(v) Be maintained in a sanitary condition;

(vi) Have a nonshatterable port through which the occupant(s) may be kept under constant observation;

(vii) Be designed for a working pressure of 75 p.s.i.g.;

(viii) Be equipped with internal controls which may be overridden by external controls;

(ix) Be provided with air pressure gauges to show the air pressure within each compartment to observers inside and outside the medical lock;

(x) Be equipped with a manual type sprinkler system that can be activated inside the lock or by the outside lock tender;

(xi) Be provided with oxygen lines and fittings leading into external tanks. The lines shall be fitted with check valves to prevent reverse flow. The oxygen system inside the chamber shall be of a closed circuit design and be so designed as to automatically shut off the oxygen supply whenever the fire system is activated.

(xii) Be in constant charge of an attendant under the direct control of the retained physician. The attendant shall be trained in the use of the lock and suitably instructed regarding steps to be taken in the treatment of employee exhibiting symptoms compatible with a diagnosis of decompression illness;

(xiii) Be adjacent to an adequate emergency medical facility;

(xiv) The medical facility shall be equipped with demand-type oxygen inhalation equipment approved by the U.S. Bureau of Mines or Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH);

(xv) Be capable of being maintained at a temperature, in use, not to exceed 90°F. nor be less than 70°F.; and

(xvi) Be provided with sources of air, free of oil and carbon monoxide, for normal and emergency use, which are capable of raising the air pressure in the lock from 0 to 75 p.s.i.g. in 5 minutes.

(k) Identification badges shall be furnished to all employees, indicating that the wearer is a compressed air worker. A permanent record shall be kept of all identification badges issued. The badge shall give the employee's name, address of the medical lock, the telephone number of the licensed physician for the compressed air project, and contain instructions that in case of emergency of unknown or doubtful cause or illness, the wearer shall be rushed to the medical lock. The badge shall be worn at all times—off the job, as well as on the job.

(3) Telephone and signal communication. Effective and reliable means of communication, such as bells, whistles, or telephones, shall be maintained at all times between all the following locations;

(a) The working chamber face;

(b) The working chamber side of the man lock near the door;

(c) The interior of the man lock;

(d) Lock attendant's station;

(e) The compressor plant;

(f) The first-aid station;

(g) The emergency lock (if one is required); and

(h) The special decompression chamber (if one is required).

(4) Signs and records.

(a) The time of decompression shall be posted in each man lock as follows:

TIME OF DECOMPRESSION FOR THIS LOCK

..... pounds to pounds in minutes.

..... pounds to pounds in minutes.

(Signed by)
(Superintendent)

This form shall be posted in the man lock at all times.

(b) Any code of signals used shall be conspicuously posted near workplace entrances and such other locations as may be necessary to bring them to the attention of all employees concerned.

(c) For each 8-hour shift, a record of employees employed under air pressure shall be kept by an employee who shall remain outside the lock near the entrance. This record shall show the period each employee spends in the air chamber and the time taken from decompression. A copy shall be submitted to the appointed physician after each shift.

(5) Compression.

(a) Every employee going under air pressure for the first time shall be instructed on how to avoid excessive discomfort.

(b) During the compression of employees, the pressure shall not be increased to more than 3 p.s.i.g. within the first minute. The pressure shall be held at 3 p.s.i.g. and again at 7 p.s.i.g. sufficiently long to determine if any employees are experiencing discomfort.

(c) After the first minute the pressure shall be raised uniformly and at a rate not to exceed 10 p.s.i. per minute.

(d) If any employee complains of discomfort, the pressure shall be held to determine if the symptoms are relieved. If, after 5 minutes the discomfort does not disap-

pear, the lock attendant shall gradually reduce the pressure until the employee signals that the discomfort has ceased. If the employee does not indicate that the discomfort has disappeared, the lock attendant shall reduce the pressure to atmospheric and the employee shall be released from the lock.

(e) No employee shall be subjected to pressure exceeding 50 pounds per square inch except in an emergency.

(6) Decompression.

(a) Decompression to normal condition shall be in accordance with the decompression tables in Appendix A of this part.

(b) In the event it is necessary for an employee to be in compressed air more than once in a 24-hour period, the appointed physician shall be responsible for the establishment of methods and procedures of decompression applicable to repetitive exposures.

(c) If decanting is necessary, the appointed physician shall establish procedures before any employee is permitted to be decompressed by decanting methods. The period of time that the employees spend at atmospheric pressure between the decompression following the shift and recompression shall not exceed 5 minutes.

(7) Man locks and special decompression chambers.

(a) Man locks.

(i) Except in emergency, no employees employed in compressed air shall be permitted to pass from the working chamber to atmospheric pressure until after decompression, in accordance with the procedures in this part.

(ii) The lock attendant in charge of a man lock shall be under the direct supervision of the appointed physician. The lock attendant shall be stationed at the lock controls on the free air side during the period of compression and decompression and shall remain at the lock control station whenever there are persons in the working chamber or in the man lock.

(iii) Except where air pressure in the working chamber is below 12 p.s.i.g., each man lock shall be equipped with automatic controls which, through taped programs, cams, or similar apparatus, shall automatically regulate decompressions. It shall also be equipped with manual controls to permit the lock attendant to override the automatic mechanism in the event of an emergency, as provided in item (viii) of this subdivision.

(iv) A manual control, which can be used in the event of an emergency, shall be placed inside the man lock.

(v) A clock, thermometer, and continuous recording pressure gauge with a 4-hour graph shall be installed outside of each man lock and shall be changed prior to each shift's decompression. The chart shall be of sufficient size to register a legible record of variations in pressure within the man lock and shall be visible to the lock attendant. A copy of each graph shall be submitted to the appointed physician after each shift. In addition, a pressure gauge, clock, and thermometer shall also be installed in each man lock. Additional fittings shall be provided so that the test gauges may be attached whenever necessary.

(vi) Except where air pressure is below 12 p.s.i.g. and there is no danger of rapid flooding, all caissons having a working area greater than 150 square feet, and each bulkhead in tunnels of 14 feet or more in diameter, or equivalent area, shall have at least two locks in perfect working

condition, one of which shall be used exclusively as a man lock, the other, as a materials lock.

(vii) Where only a combination man-and-materials lock is required, this single lock shall be of sufficient capacity to hold the employees constituting two successive shifts.

(viii) Emergency locks shall be large enough to hold an entire heading shift and a limit maintained of 12 p.s.i.g. There shall be a chamber available for oxygen decompression therapy to 28 p.s.i.g.

(ix) The man lock shall be large enough so that those using it are not compelled to be in a cramped position and shall not have less than 5 feet clear head room at the center and a minimum of 30 cubic feet of air space per occupant.

(x) Locks on caissons shall be so located that the bottom door shall be not less than 3 feet above the water level surrounding the caisson on the outside. (The water level, where it is affected by tides, is construed to mean high tide.)

(xi) In addition to the pressure gauge in the locks, an accurate pressure gauge shall be maintained on the outer and inner side of each bulkhead. These gauges shall be accessible at all times and shall be kept in accurate working order.

(xii) Man locks shall have an observation port at least 4 inches in diameter located in such a position that all occupants of the man lock may be observed from the working chamber and from the free air side of the lock.

(xiii) Adequate ventilation in the lock shall be provided.

(xiv) Man locks shall be maintained at a minimum temperature of 70°F.

(xv) When locks are not in use and employees are in the working chamber, lock doors shall be kept open to the working chamber, where practicable.

(xvi) Provision shall be made to allow for rescue parties to enter the tunnel if the working force is disabled.

(xvii) A special decompression chamber of sufficient size to accommodate the entire force of employees being decompressed at the end of a shift shall be provided whenever the regularly established working period requires total time of decompression exceeding 75 minutes.

(b) Special decompression chamber.

(i) The headroom in the special decompression chamber shall be not less than a minimum 7 feet and the cubical content shall provide at least 50 cubic feet of airspace for each employee. For each occupant, there shall be provided 4 square feet of free walking area and 3 square feet of seating space, exclusive of area required for lavatory and toilet facilities. The rated capacity shall be based on the stated minimum space per employee and shall be posted at the chamber entrance. The posted capacity shall not be exceeded, except in case of emergency.

(ii) Each special decompression chamber shall be equipped with the following:

(A) A clock or clocks suitably placed so that the attendant and the chamber occupants can readily ascertain the time;

(B) Pressure gauges which will indicate to the attendants and to the chamber occupants the pressure in the chamber;

(C) Valves to enable the attendant to control the supply and discharge of compressed air into and from the chamber.

(D) Valves and pipes, in connection with the air supply and exhaust, arranged so that the chamber pressure can be controlled from within and without;

(E) Effective means of oral intercommunication between the attendant, occupants of the chamber, and the air compressor plant; and

(F) An observation port at the entrance to permit observation of the chamber occupants.

(iii) Seating facilities in special decompression chambers shall be so arranged as to permit a normal sitting posture without cramping. Seating space, not less than 18 inches by 24 inches wide, shall be provided per occupant.

(iv) Adequate toilet and washing facilities, in a screened or enclosed recess, shall be provided. Toilet bowls shall have a built-in protector on the rim so that an air space is created when the seat lid is closed.

(v) Fresh and pure drinking water shall be available. This may be accomplished by either piping water into the special decompression chamber and providing drinking fountains, or by providing individual canteens, or by some other sanitary means. Community drinking vessels are prohibited.

(vi) No refuse or discarded material of any kind shall be permitted to accumulate, and the chamber shall be kept clean.

(vii) Unless the special decompression chamber is serving as the man lock to atmospheric pressure, the special decompression chamber shall be situated, where practicable, adjacent to the man lock on the atmospheric pressure side of the bulkhead. A passageway shall be provided, connecting the special chamber with the man lock, to permit employees in the process of decompression to move from the man lock to the special chamber without a reduction in the ambient pressure from that designated for the next stage of decompression. The passageway shall be so arranged as to not interfere with the normal operation of the man lock, nor with the release of the occupants of the special chamber to atmospheric pressure upon the completion of the decompression procedure.

(8) Compressor plant and air supply.

(a) At all times there shall be a thoroughly experienced, competent, and reliable person on duty at the air control valves as a gauge tender who shall regulate the pressure in the working areas. During tunneling operations, one gauge tender may regulate the pressure in not more than two headings: Provided; That the gauges and controls are all in one location. In caisson work, there shall be a gauge tender for each caisson.

(b) The low air compressor plant shall be of sufficient capacity to not only permit the work to be done safely, but shall also provide a margin to meet emergencies and repairs.

(c) Low air compressor units shall have at least two independent and separate sources of power supply and each shall be capable of operating the entire low air plant and its accessory systems.

(d) The capacity, arrangement, and number of compressors shall be sufficient to maintain the necessary pressure without overloading the equipment and to assure maintenance of such pressure in the working chamber during periods of breakdown, repair, or emergency.

(e) Switching from one independent source of power supply to the other shall be done periodically to ensure that workability of the apparatus in an emergency.

(f) Duplicate low-pressure air feedlines and regulating valves shall be provided between the source of air supply and a point beyond the locks with one of the lines extending to within 100 feet of the working face.

(g) All high-pressure and low-pressure air supply lines shall be equipped with check valves.

(h) Low-pressure air shall be regulated automatically. In addition, manually operated valves shall be provided for emergency conditions.

(i) The air intakes for all air compressors shall be located at a place where fumes, exhaust gases, and other air contaminants will be at a minimum.

(j) Gauges indicating the pressure in the working chamber shall be installed in the compressor building, the lock attendant's station, and at the employer's field office.

(9) Ventilation and air quality.

(a) Exhaust valves and exhaust pipes shall be provided and operated so that the working chamber shall be well ventilated, and there shall be no pockets of dead air. Outlets may be required at intermediate points along the main low-pressure air supply line to the heading to eliminate such pockets of dead air. The quantity of ventilation air shall be not less than 30 cubic feet per minute.

(b) The air in the workplace shall be analyzed by the employer not less than once each shift, and records of such tests shall be kept on file at the place where the work is in progress. The test results shall be within the threshold limit values specified in part B of this chapter, for hazardous gases, and within 10 percent of the lower explosive limit of flammable gases. If these limits are not met, immediate action to correct the situation shall be taken by the employer.

(c) The temperature of all working chambers which are subjected to air pressure shall, by means of after-coolers or other suitable devices, be maintained at a temperature not to exceed 85°F.

(d) Forced ventilation shall be provided during decompression. During the entire decompression period, forced ventilation through chemical or mechanical air purifying devices that will ensure a source of fresh air shall be provided.

(e) Whenever heat-producing machines (moles, shields) are used in compressed air tunnel operations, a positive means of removing the heat build-up at the heading shall be provided.

(10) Electricity.

(a) All lighting in compressed-air chambers shall be by electricity exclusively, and two independent electric-lighting systems with independent sources of supply shall be used. The emergency source shall be arranged to become automatically operative in the event of failure of the regularly used source.

(b) The minimum intensity of light on any walkway, ladder, stairway, or working level shall be not less than 10 foot-candles, and in all workplaces the lighting shall at all times be such as to enable employees to see clearly.

(c) All electrical equipment, and wiring for light and power circuits, shall comply with requirements of Part I, of this standard, for use in damp, hazardous, high temperature, and compressed air environments.

(d) External parts of lighting fixtures and all other electrical equipment, when within 8 feet of the floor, shall be

constructed of noncombustible, nonabsorptive, insulating materials, except that metal may be used if it is effectively grounded.

(e) Portable lamps shall be equipped with noncombustible, nonabsorptive, insulating sockets, approved handles, basket guards, and approved cords.

(f) The use of worn or defective portable and pendant conductors is prohibited.

(11) Sanitation.

(a) Sanitary, heated, lighted, and ventilated dressing rooms and drying rooms shall be provided for all employees engaged in compressed air work. Such rooms shall contain suitable benches and lockers. Bathing accommodations (showers at the ratio of one to 10 employees per shift), equipped with running hot and cold water, and suitable and adequate toilet accommodations, shall be provided. One toilet for each 15 employees, or fractional part thereof, shall be provided.

(b) When the toilet bowl is shut by a cover, there should be an air space so that the bowl or bucket does not implode when pressure is increased.

(c) All parts of caissons and other working compartments shall be kept in a sanitary condition.

(12) Fire prevention and protection.

(a) Fire fighting equipment shall be available at all times and shall be maintained in working condition.

(b) While welding or flame-cutting is being done in compressed air, a firewatch with a fire hose or approved extinguisher shall stand by until such operation is completed.

(c) Shafts and caissons containing flammable material of any kind, either above or below ground, shall be provided with a waterline and a fire hose connected thereto, so arranged that all points of the shaft or caisson are within reach of the hose stream.

(d) Fire hose shall be at least 1 1/2 inches in nominal diameter; the water pressure shall at all times be adequate for efficient operation of the type of nozzle used; and the water supply shall be such as to ensure an uninterrupted flow. Fire hose, when not in use, shall be located or guarded to prevent injury thereto.

(e) The power house, compressor house, and all buildings housing ventilating equipment, shall be provided with at least one hose connection in the waterline, with a fire hose connected thereto. A fire hose shall be maintained within reach of structures of wood over or near shafts.

(f) Tunnels shall be provided with a 2-inch minimum diameter waterline extending into the working chamber and to within 100 feet of the working face. Such line shall have hose outlets with 100 feet of fire hose attached and maintained as follows: One at the working face; one immediately inside of the bulkhead of the working chamber; and one immediately outside such bulkhead. In addition, hose outlets shall be provided at 200-foot intervals throughout the length of the tunnel, and 100 feet of fire hose shall be attached to the outlet nearest to any location where flammable material is being kept or stored or where any flame is being used.

(g) In addition to fire hose protection required by this part, on every floor of every building not under compressed air, but used in connection with the compressed air work, there shall be provided at least one approved fire extinguisher of the proper type for the hazards involved. At least two approved fire extinguishers shall be provided in the working

chamber as follows: One at the working face and one immediately inside the bulkhead (pressure side). Extinguishers in the working chamber shall use water as the primary extinguishing agent and shall not use any extinguishing agent which could be harmful to the employees in the working chamber. The fire extinguisher shall be protected from damage.

(h) Highly combustible materials shall not be used or stored in the working chamber. Wood, paper, and similar combustible material shall not be used in the working chamber in quantities which could cause a fire hazard. The compressor building shall be constructed of noncombustible material.

(i) Man locks shall be equipped with a manual type fire extinguisher system that can be activated inside the man lock and also by the outside lock attendant. In addition, a fire hose and portable fire extinguisher shall be provided inside and outside the man lock. The portable fire extinguisher shall be the dry chemical type.

(j) Equipment, fixtures, and furniture in man locks and special decompression chambers shall be constructed of noncombustible materials. Bedding, etc., shall be chemically treated so as to be fire resistant.

(k) Head frames shall be constructed of structural steel or open frame-work fireproofed timber. Head houses and other temporary surface buildings or structures within 100 feet of the shaft, caisson, or tunnel opening shall be built of fire-resistant materials.

(l) No oil, gasoline, or other combustible materials shall be stored within 100 feet of any shaft, caisson, or tunnel opening, except that oils may be stored in suitable tanks in isolated fireproof buildings, provided such buildings are not less than 50 feet from any shaft, caisson, or tunnel opening, or any building directly connected thereto.

(m) Positive means shall be taken to prevent leaking flammable liquids from flowing into the areas specifically mentioned in the preceding subdivision.

(n) All explosives used in connection with compressed air work shall be selected, stored, transported, and used as specified in part T of this chapter.

(13) Bulkheads and safety screens.

(a) Intermediate bulkheads with locks, or intermediate safety screens or both, are required where there is danger of rapid flooding.

(b) In tunnels 16 feet or more in diameter, hanging walkways shall be provided from the face to the man lock as high in the tunnel as practicable, with at least 6 feet of head room. Walkways shall be constructed of noncombustible material. Standard railings shall be securely installed throughout the length of all walkways on open sides in accordance with Part C-1 of this chapter. Where walkways are ramped under safety screens, the walkway surface shall be skidproofed by cleats or by equivalent means.

(c) Bulkheads used to contain compressed air shall be tested, where practicable, to prove their ability to resist the highest air pressure which may be expected to be used.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-745, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-745, filed 7/20/94, effective 9/20/94; 88-23-054 (Order 88-25), § 296-155-745, filed 11/14/88; Order 74-26, § 296-155-745, filed 5/7/74, effective 6/6/74.]

Chapter 296-304 WAC
SAFETY STANDARDS FOR SHIP REPAIRING,
SHIPBUILDING AND SHIPBREAKING

WAC

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WAC 296-304-010 Scope and application. (1) The provisions and standards of the general safety and health standards, chapters 296-24 and 296-62 WAC, and such other codes and standards as are promulgated by the department of labor and industries which are applicable to all industries, shall be applicable in the ship repairing, shipbuilding, or shipbreaking industries whenever the employees are covered under the Washington State Industrial Safety and Health Act, chapter 49.17 RCW. The rules of this chapter and the rules of the aforementioned chapters 296-24 and 296-62 WAC are applicable to all ship repairing, shipbuilding, and shipbreaking industries and operations, provided that such rules shall not be applicable to those operations under the exclusive safety jurisdiction of the federal government.

(2) The responsibility for compliance with these regulations is placed upon "employers" as defined in WAC 296-304-01001(3).

(3) It is not the intent of these regulations to place additional responsibilities or duties on owners, operators, agents or masters of vessels unless such persons are acting as employers, nor is it the intent of these regulations to relieve such owners, operators, agents or masters of vessels from responsibilities or duties now placed upon them by law, regulation or custom.

(4) The responsibilities placed upon the competent person herein shall be deemed to be the responsibilities of the employer.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-010, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-010, filed 1/18/95, effective 3/10/95; 89-11-035 (Order 89-03), § 296-304-010, filed 5/15/89, effective 6/30/89; Order 75-6, § 296-304-010, filed 3/10/75; Order 74-25, § 296-304-010, filed 5/7/74.]

WAC 296-304-01001 Definitions. (1) "Shall" indicates provisions which are mandatory.

(2) "Director" means the director of the department of labor and industries or his/her designated representative.

(3) "Employer" means an employer any of whose employees are employed, in whole or in part, in ship repair or related employments as defined in these standards on the navigable waters of the United States, including dry docks, graving docks and marine railways.

(4) "Employee" means any person engaged in ship repairing, shipbuilding, or shipbreaking or related employments on the navigable waters of the United States, including dry docks, graving docks and marine railways, other than the master, ship's officers, crew of the vessel, or any person engaged by the master to repair any vessel under 18 net tons.

(5) "Gangway" means any ramp-like or stair-like means of access provided to enable personnel to board or leave a vessel including accommodation ladders, gangplanks and bows.

(6) "Vessel" includes every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water, including special purpose floating structures not primarily designed for or used as a means of transportation on water.

(7) For purposes of WAC 296-304-05007, the term "barge" means an unpowered, flat bottom, shallow draft vessel including scows, carfloats and lighters. For purposes of these standards, the term does not include ship shaped or deep draft barges.

(8) For purposes of WAC 296-304-05007, the term "river tow boat" means a shallow draft, low free board, self-propelled vessel designed to tow river barges by pushing ahead. For purposes of these standards, the term does not include other towing vessels.

(9) "Shipbreaking" means any breaking down of a vessel's structure for the purpose of scrapping the vessel, including the removal of gear, equipment or any component part of a vessel.

(10) "Shipbuilding" means the construction of a vessel, including the installation of machinery and equipment.

(11) "Ship repair" means any repair of a vessel including, but not restricted to, alterations, conversions, installations, cleaning, painting, and maintenance work.

(12) "Related employment" means any employment performed as an incident to or in conjunction with ship repairing, shipbuilding or shipbreaking work, including, but not restricted to, inspection, testing and employment as a watchman.

(13) "Hazardous substance" means a substance which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritant, or otherwise harmful is likely to cause injury.

(14) "Competent person" means a person who is capable of recognizing and evaluating employee exposure to hazardous substances or to other unsafe conditions and is capable of specifying the necessary protection and precautions to be taken to ensure the safety of employees as required by the particular regulation under the condition to which it applies. For the purposes of WAC 296-304-020, explosives and other dangerous atmospheres, WAC 296-304-030, surface prepara-

tion and preservation, and WAC 296-304-040, welding, cutting and heating, except for WAC 296-304-03007 (2)(h) and 296-304-03009 (1)(e), to which the above definition applies, the competent person must also meet the additional requirements of WAC 296-304-01005, Competent person.

(15) "Confined space" means a compartment of small size and limited access such as a double bottom tank, cofferdam, or other space which by its small size and confined nature can readily create or aggravate a hazardous exposure.

(16) "Enclosed space" means any space, other than a confined space, which is enclosed by bulkheads and overhead. It includes cargo holds, tanks, quarters, and machinery and boiler spaces.

(17) "Hot-work" means riveting, welding, burning or other fire or spark producing operations.

(18) "Cold-work" means any work which does not involve riveting, welding, burning or other fire or spark producing operations.

(19) "Portable unfired pressure vessel" means any pressure container or vessel used aboard ship, other than the ship's equipment, containing liquids or gases under pressure, excepting pressure vessels built to ICC regulations under 49 CFR Part 78, Subparts C and H.

(20) "Powder actuated fastening tool" means a tool or machine which drives a stud, pin, or fastener by means of an explosive charge.

(21) For purposes of WAC 296-304-06013, the term "hazardous material" means a material which has one or more of the following characteristics: (a) Has a flash point below 140°F., closed cup, or is subject to spontaneous heating; (b) has a threshold limit value below 500 p.p.m. in the case of a gas or vapor, below 500 mg./m.³ for fumes, and below 25 m.p.p.c.f. in case of a dust; (c) has a single dose oral LD₅₀ below 500 mg./kg.; (d) is subject to polymerization with the release of large amounts of energy; (e) is a strong oxidizing or reducing agent; (f) causes first degree burns to skin in short time exposure, or is systemically toxic by skin contact; or (g) in the course of normal operations, may produce dusts, gases, fumes, vapors, mists, or smokes which have one or more of the above characteristics.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-01001, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-01001, filed 3/1/76; Order 74-25, § 296-304-01001, filed 5/7/74.]

WAC 296-304-01005 Competent person. (1)

Application. This section applies to shipyard employment.

(2) Designation.

(a) One or more competent persons shall be designated by the employer in accordance with the applicable requirements of this section, unless the requirements of WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, and WAC 296-304-080 through 296-304-08011, are always carried out by a marine chemist.

Exception: The employer may designate any person who meets the applicable portions of the criteria set forth in subsection (3) of this section as a competent person who is limited to performing testing to the following situations:

(i) Repair work on small craft in boat yards where only combustible gas indicator tests are required for fuel tank leaks or when using flammable paints below decks;

(ii) Building of wooden vessels where only knowledge of the precautions to be taken when using flammable paints is required;

(iii) The breaking of vessels where there is no fuel oil or other flammable hazard; and

(iv) Tests and inspections performed to comply with WAC 296-304-03007 (2)(h) and 296-304-03009 (1)(e).

(b) The employer shall maintain either a roster of designated competent persons or a statement that a marine chemist will perform the tests or inspections which require a competent person.

(c) The employer shall make the roster of designated persons or the statement available to employees, the employee's representative, or the director upon request.

(d) The roster shall contain, as a minimum, the following:

(i) The employer's name;

(ii) The designated competent person's name(s); and

(iii) The date the employee was trained as a competent person.

(3) Criteria. The employer shall ensure that each designated competent person has the following skills and knowledge:

(a) Ability to understand and carry out written or oral information or instructions left by marine chemist, Coast Guard authorized persons and certified industrial hygienists;

(b) Knowledge of WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, and WAC 296-304-080 through 296-304-08011;

(c) Knowledge of the structure, location, and designation of spaces where work is done;

(d) Ability to calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;

(e) Ability to perform all required tests and inspections which are or may be performed by a competent person as set forth in WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, and WAC 296-304-080 through 296-304-08011;

(f) Ability to inspect, test, and evaluate spaces to determine the need for further testing by a marine chemist or a certified industrial hygienist; and

(g) Ability to maintain records required by this section.

(4) Recordkeeping.

(a) When tests and inspections are performed by a competent person, marine chemist, or certified industrial hygienist as required by any provisions of WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, or WAC 296-304-080 through 296-304-08011, the employer shall ensure that the person performing the test and inspection records the location, time, date, location of inspected spaces, and the operations performed, as well as the test results and any instructions.

(b) The employer shall ensure that the records are posted in the immediate vicinity of the affected operations while work in the spaces is in progress. The records shall be kept on file for a period of at least three months from the completion date of the specific job for which they were generated.

(c) The employer shall ensure that the records are available for inspection by the director, and employees and their representatives.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-01005, filed 1/18/95, effective 3/10/95.]

WAC 296-304-020 Confined and enclosed spaces and other dangerous atmospheres in shipyard employment. Scope, application and definitions applicable to this subsection: (1) Scope and application. This section applies to work in confined and enclosed spaces and other dangerous atmospheres in shipyard employment, including vessels, vessel sections, and on land-side operations regardless of geographic location.

(2) Definitions applicable to this section:

Adjacent spaces means those spaces bordering a subject space in all directions, including all points of contact, corners, diagonals, decks, tank tops, and bulkheads.

Certified industrial hygienist (CIH) means an industrial hygienist who is certified by the American Board of Industrial Hygiene.

Coast Guard authorized person means an individual who meets the requirement of WAC 296-304-02015, Appendix B, for tank vessels, for passenger vessels, and for cargo and miscellaneous vessels.

Dangerous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (i.e., escape unaided from a confined or enclosed space), injury, or acute illness.

Director means the director of the department of labor and industries or his/her designated representative.

Enter with restrictions denotes a space where entry for work is permitted only if engineering controls, personal protective equipment, clothing, and time limitations are as specified by the marine chemist, certified industrial hygienist, or the shipyard competent person.

Entry means the action by which a person passes through an opening into a space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Hot work means any activity involving riveting, welding, burning, the use of powder-actuated tools or similar fire-producing operations. Grinding, drilling, abrasive blasting, or similar spark-producing operations are also considered hot work except when such operations are isolated physically from any atmosphere containing more than 10 percent of the lower explosive limit of a flammable or combustible substance.

Immediately dangerous to life or health (IDLH) means an atmosphere that poses an immediate threat to life or that is likely to result in acute or immediate severe health effects.

Inert or inerted atmosphere means an atmospheric condition where:

(a) The oxygen content of the atmosphere in the space is maintained at a level equal to or less than 8.0 percent by volume or at a level at or below 50 percent of the amount required to support combustion, whichever is less; or

(b) The space is flooded with water and the vapor concentration of flammable or combustible materials in the free space atmosphere above the water line is less than 10 percent of the lower explosive limit for the flammable or combustible material.

Labeled means identified with a sign, placard, or other form of written communication, including pictograms, that provides information on the status or condition of the work space to which it is attached.

Lower explosive limit (LEL) means the minimum concentration of vapor in air below which propagation of a flame does not occur in the presence of an ignition source.

Marine chemist means an individual who possesses a current marine chemist certificate issued by the National Fire Protection Association (NFPA).

NFPA means National Fire Protection Association.

Nationally Recognized Testing Laboratory (NRTL) means an organization recognized by OSHA, in accordance with Appendix A of 29 CFR 1910.7, which tests for safety and lists or labels or accepts equipment and materials that meet all the criteria found in Section 1910.7(b)(1) through (b)(4)(ii).

Not safe for hot work denotes a space where hot work may not be performed because the conditions do not meet the criteria for "safe for hot work."

Not safe for workers denotes a space where an employee may not enter because the conditions do not meet the criteria for "safe for workers."

Oxygen-deficient atmosphere means an atmosphere having an oxygen concentration of less than 19.5 percent by volume.

Oxygen-enriched atmosphere means an atmosphere that contains 22.0 percent or more oxygen by volume.

Safe for hot work denotes a space that meets all of the following criteria:

(a) The oxygen content of the atmosphere does not exceed 22.0 percent by volume;

(b) The concentration of flammable vapors in the atmosphere is less than 10 percent of the lower explosive limit;

(c) The residues or materials in the space are not capable of producing a higher concentration than permitted in (a) or (b) of the above, under existing atmospheric conditions in the presence of hot work and while maintained as directed by the marine chemist or competent person; and

(d) All adjacent spaces have been cleaned, or inerted, or treated sufficiently to prevent the spread of fire.

Safe for workers denotes a space that meets the following criteria:

(a) The oxygen content of the atmosphere is at least 19.5 percent and below 22.0 percent by volume;

(b) The concentration of flammable vapors is below 10 percent of the lower explosive limit (LEL);

(c) Any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, or inerting media are within permissible concentrations at the time of the inspection; and

(d) Any residues or materials associated with the work authorized by the marine chemist, certified industrial hygienist, or competent person will not produce uncontrolled release of toxic materials under existing atmospheric conditions while maintained as directed.

Space means an area on a vessel or vessel section or within a shipyard such as, but not limited to: Cargo tanks or holds; pump or engine rooms; storage lockers; tanks containing flammable or combustible liquids, gases, or solids; rooms within buildings; crawl spaces; tunnels; or accessways. The atmosphere within a space is the entire area within its bounds.

Upper explosive limit (UEL) means the maximum concentration of flammable vapor in air above which propagation of flame does not occur on contact with a source of ignition.

Vessel section means a subassembly, module, or other component of a vessel being built, repaired, or broken.

Visual inspection means the physical survey of the space, its surroundings and contents to identify hazards such as, but not limited to, restricted accessibility, residues, unguarded machinery, and piping or electrical systems.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-020, filed 1/18/95, effective 3/10/95; 93-04-111 (Order 92-15), § 296-304-020, filed 2/3/93, effective 3/15/93; Order 74-25, § 296-304-020, filed 5/7/74.]

WAC 296-304-02001 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02001, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-02001, filed 3/1/76; Order 74-25, § 296-304-02001, filed 5/7/74.]

WAC 296-304-02003 Precautions and the order of testing before entering confined and enclosed spaces and other dangerous atmospheres. The employer shall ensure that atmospheric testing is performed in the following sequence: Oxygen content, flammability, toxicity.

(1) Oxygen content.

(a) The employer shall ensure that the following spaces are visually inspected and tested by a competent person to determine the atmosphere's oxygen content prior to initial entry into the space by an employee:

(i) Spaces that have been sealed, such as, but not limited to, spaces that have been coated and closed up, and nonventilated spaces that have been freshly painted;

(ii) Spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases;

(iii) Spaces and adjacent spaces that contain or have contained liquids, gases, or solids that are toxic, corrosive, or irritant;

(iv) Spaces and adjacent spaces that have been fumigated; and

(v) Spaces containing materials or residues of materials that create an oxygen-deficient atmosphere.

(b) If the space to be entered contains an oxygen deficient atmosphere, the space shall be labeled "not safe for workers" or, if oxygen-enriched, "not safe for workers—not safe for hot work." If an oxygen-deficient or oxygen-enriched atmosphere is found, ventilation shall be provided at volumes and flow rates sufficient to ensure that the oxygen content is maintained at or above 19.5 percent and below 22.0 percent by volume. The warning label may be

removed when the oxygen content is equal to or greater than 19.5 and less than 22.0 percent by volume.

(c) An employee may not enter a space where the oxygen content, by volume, is below 19.5 percent or above 22.0 percent.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space provided:

(i) The atmosphere in the space is monitored for oxygen content, by volume, continuously; and

(ii) Respiratory protection and other appropriate personal protective equipment and clothing are provided in accordance with WAC 296-304-090 through 296-304-09007.

Note to (a): Other provisions for work in IDLH atmospheres are located in WAC 296-304-090 through 296-304-09007.

(2) Flammable atmospheres.

(a) The employer shall ensure that spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases are:

(i) Inspected visually by the competent person to determine the presence of combustible or flammable liquids; and

(ii) Tested by a competent person prior to entry by an employee to determine the concentration of flammable vapors and gases within the space.

(b) If the concentration of flammable vapors or gases in the space to be entered is equal to or greater than 10 percent of the lower explosive limit, the space shall be labeled "not safe for workers" and "not safe for hot work." Ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration of flammable vapors is maintained below 10 percent of the lower explosive limit. The warning labels may be removed when the concentration of flammable vapors is below 10 percent of the lower explosive limit.

(c) An employee may not enter a space where the concentration of flammable vapors or gases is equal to or greater than 10 percent of the lower explosive limit. Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space, provided:

(i) No ignition sources are present;

(ii) The atmosphere in the space is monitored continuously;

(iii) Atmospheres at or above the upper explosive limit are maintained; and

(iv) Respiratory protection and other appropriate personal protective equipment and clothing are provided in accordance with WAC 296-304-090 through 296-304-09007.

Note 1 to (2): Additional provisions for work in IDLH atmospheres are located in WAC 296-304-090 through 296-304-09007.

Note 2 to (2): Additional provisions for work in spaces containing a flammable substance which also has a permissible exposure limit, are located in subsection (3) of this section and chapter 296-62 WAC, Part H.

(3) Toxic, corrosive, irritant or fumigated atmospheres and residues.

(a) The employer shall ensure that spaces or adjacent spaces that contain or have contained liquids, gases, or solids that are toxic, corrosive or irritant are:

(i) Inspected visually by the competent person to determine the presence of toxic, corrosive, or irritant residue contaminants; and

(ii) Tested by a competent person prior to initial entry by an employee to determine the air concentration of toxics, corrosives, or irritants within the space.

(b) If a space contains an air concentration of a material which exceeds a chapter 296-62 WAC, Part H, permissible exposure limit (PEL) or is IDLH, the space shall be labeled "not safe for workers." Ventilation shall be provided at volumes and flow rates which will ensure that air concentrations are maintained within the PEL or, in the case of contaminants for which there is no established PEL, below the IDLH. The warning label may be removed when the concentration of contaminants is maintained within the PEL or below IDLH level.

(c) If a space cannot be ventilated to within the PELs or is IDLH, a marine chemist or CIH must re-test until the space can be certified "enter with restrictions" or "safe for workers."

(d) An employee may not enter a space whose atmosphere exceeds a PEL or is IDLH.

Exception: An employee may enter for emergency rescue, or for a short duration for installation of ventilation equipment provided:

(i) The atmosphere in the space is monitored continuously;

(ii) Respiratory protection and other necessary and appropriate personal protective equipment and clothing are provided in accordance with WAC 296-304-090 through 296-304-09007.

Note to (3): Other provisions for work in IDLH atmospheres are located in WAC 296-304-090 through 296-304-09007.

(4) Training of employees entering confined and enclosed spaces or other dangerous atmospheres.

(a) The employer shall ensure that each employee that enters a confined or enclosed space and other areas with dangerous atmospheres is trained to perform all required duties safely.

(b) The employer shall ensure that each employee who enters a confined space, enclosed space, or other areas with dangerous atmospheres is trained to:

(i) Recognize the characteristics of the confined space;

(ii) Anticipate and be aware of the hazards that may be faced during entry;

(iii) Recognize the adverse health effects that may be caused by the exposure to a hazard;

(iv) Understand the physical signs and reactions related to exposures to such hazards;

(v) Know what personal protective equipment is needed for safe entry into and exit from the space;

(vi) Use personal protective equipment; and

(vii) Where necessary, be aware of the presence and proper use of barriers that may be needed to protect an entrant from hazards.

(c) The employer shall ensure that each entrant into confined or enclosed spaces or other dangerous atmospheres is trained to exit the space or dangerous atmosphere whenever:

(i) The employer or his or her representative orders evacuation;

(ii) An evacuation signal such as an alarm is activated; or

(iii) The entrant perceives that he or she is in danger.

(d) The employer shall provide each employee with training:

(i) Before the entrant begins work addressed by this chapter; and

(ii) Whenever there is a change in operations or in an employee's duties that presents a hazard about which the employee has not previously been trained.

(e) The employer shall certify that the training required by (a) through (d) of this subsection has been accomplished.

(i) The certification shall contain the employee's name, the name of the certifier, and the date(s) of the certification.

(ii) The certification shall be available for inspection by the director, employees, and their representatives.

(5) Rescue teams. The employer shall either establish a shipyard rescue team or arrange for an outside rescue team which will respond promptly to a request for rescue service.

(a) Shipyard rescue teams shall meet the following criteria:

(i) Each employee assigned to the shipyard team shall be provided with and trained to use the personal protective equipment he or she will need, including respirators and any rescue equipment necessary for making rescues from confined and enclosed spaces and other dangerous atmospheres.

(ii) Each employee assigned to the shipyard rescue team shall be trained to perform his or her rescue functions including confined and enclosed and other dangerous atmosphere entry.

(iii) Shipyard rescue teams shall practice their skills at least once every 12 months. Practice drills shall include the use of mannequins and rescue equipment during simulated rescue operations involving physical facilities that approximate closely those facilities from which rescue may be needed.

Note to (5)(a)(iii): If the team performs an actual rescue during the 12 month period, an additional practice drill for that type of rescue is not required.

(iv) At least one person on each rescue team shall maintain current certification in basic first aid which includes maintenance of an airway, control of bleeding, maintenance of circulation and cardiopulmonary resuscitation (CPR) skills.

(b) The employer shall inform outside rescue teams of the hazards that the team may encounter when called to perform confined and enclosed space or other dangerous atmosphere rescue at the employer's facility so that the rescue team can be trained and equipped.

Note to (5): The criteria for in-house rescue, listed in (5)(a) can be used by the employer in evaluating outside rescue services.

(6) Exchanging hazard information between employers. Each employer whose employees work in confined and enclosed spaces or other dangerous atmospheres shall ensure that all available information on the hazards, safety rules, and emergency procedures concerning those spaces and atmospheres is exchanged with any other employer whose employees may enter the same spaces.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-02003, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02003, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-02003, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-02003, filed 3/1/76; Order 74-25, § 296-304-02003, filed 5/7/74.]

WAC 296-304-02005 Cleaning and other cold work.

(1) Locations covered by this section. The employer shall ensure that manual cleaning and other cold work are not performed in the following spaces unless the conditions of subsection (2) of this section have been met:

(a) Spaces containing or having last contained bulk quantities of combustible or flammable liquids or gases; and

(b) Spaces containing or having last contained bulk quantities of liquids, gases or solids that are toxic, corrosive or irritating.

(2) Requirements for performing cleaning or cold work.

(a) Liquid residues of hazardous materials shall be removed from work spaces as thoroughly as practicable before employees start cleaning operations or cold work in a space. Special care shall be taken to prevent the spilling or the draining of these materials into the water surrounding the vessel, or for shore-side operations, onto the surrounding work area.

(b) Testing shall be conducted by a competent person to determine the concentration of flammable, combustible, toxic, corrosive, or irritant vapors within the space prior to the beginning of cleaning or cold work.

(c) Continuous ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration(s) of:

(i) Flammable vapor is maintained below 10 percent of the lower explosive limit; and

Note to (2)(c)(i): Spaces containing highly volatile residues may require additional ventilation to keep the concentration of flammable vapors below 10 percent of the lower explosive limit and within the permissible exposure limit.

(ii) Toxic, corrosive, or irritant vapors are maintained within the permissible exposure limits and below IDLH levels.

(d) Testing shall be conducted by the competent person as often as necessary during cleaning or cold work to assure that air concentrations are below 10 percent of the lower explosive limit and within the PELs and below IDLH levels. Factors such as, but not limited to, temperature, volatility of the residues and other existing conditions in and about the spaces are to be considered in determining the frequency of testing necessary to assure a safe atmosphere.

Note to (2)(d): See WAC 296-304-02013—Appendix A, for additional information on frequency of testing.

(e) Spills or other releases of flammable, combustible, toxic, corrosive, and irritant materials shall be cleaned up as work progresses.

(f) An employee may not enter a confined or enclosed space or other dangerous atmosphere if the concentration of flammable or combustible vapors in work spaces exceeds 10 percent of the lower explosive limit.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment provided:

- (i) No ignition sources are present;
- (ii) The atmosphere in the space is monitored continuously;
- (iii) The atmosphere in the space is maintained above the upper explosive limit; and
- (iv) Respiratory protection, personal protective equipment, and clothing are provided in accordance with WAC 206-304-090 through 296-304-09007.

Note to (2)(f): Other provisions for work in IDLH and other dangerous atmospheres are located in WAC 296-304-090 through 296-304-09007.

(g) A competent person shall test ventilation discharge areas and other areas where discharged vapors may collect to determine if vapors discharged from the spaces being ventilated are accumulating in concentrations hazardous to employees.

(h) If the tests required in (g) of this subsection indicate that concentrations of exhaust vapors that are hazardous to employees are accumulating, all work in the contaminated area shall be stopped until the vapors have dissipated or been removed.

(i) Only explosion-proof, self-contained portable lamps, or other electric equipment approved by a National Recognized Testing Laboratory (NRTL) for the hazardous location shall be used in spaces described in subsection (1) of this section, until such spaces have been certified as "safe for workers."

Note to (2)(i): Battery-fed, portable lamps or other electric equipment bearing the approval of a NRTL for the class, and division of the location in which they are used are deemed to meet the requirements of (i) of this subsection.

(j) The employer shall prominently post signs that prohibit sources of ignition within or near a space that has contained flammable or combustible liquids or gases in bulk quantities:

- (i) At the entrance to those spaces;
- (ii) In adjacent spaces; and
- (iii) In the open area adjacent to those spaces.

(k) All air moving equipment and its component parts, including duct work, capable of generating a static electric discharge of sufficient energy to create a source of ignition, shall be bonded electrically to the structure of a vessel or vessel section or, in the case of land-side spaces, grounded to prevent an electric discharge in the space.

(l) Fans shall have nonsparking blades, and portable air ducts shall be of nonsparking materials.

Note to (2): See WAC 296-304-02003(3) and applicable requirements of chapter 296-62 WAC, general occupational health standards, for other provisions affecting cleaning and cold work.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02005, filed 1/18/95, effective 3/10/95; Order 74-25, § 296-304-02005, filed 5/7/74.]

WAC 296-304-02007 Hot work. (1) Hot work requiring testing by a marine chemist or Coast Guard authorized person.

(a) The employer shall ensure that hot work is not performed in or on any of the following confined and enclosed spaces and other dangerous atmospheres, boundaries of spaces or pipelines until the work area has been

tested and certified by a marine chemist or a U.S. Coast Guard authorized person as "safe for hot work":

(i) Within, on, or immediately adjacent to spaces that contain or have contained combustible or flammable liquids or gases.

(ii) Within, on, or immediately adjacent to fuel tanks that contain or have last contained fuel; and

(iii) On pipelines, heating coils, pump fittings or other accessories connected to spaces that contain or have last contained fuel.

(iv) Exception: On dry cargo, miscellaneous and passenger vessels and in the landside operations within spaces which meet the standards for oxygen, flammability and toxicity in WAC 296-304-02003, but are adjacent to spaces containing flammable gases or liquids, as long as the gases or liquids have a flash point below 150 deg. F (65.6 deg. C) and the distance between such spaces and the work is 25 feet (7.5 m) or greater.

Note: For flammable liquids with flash points above 150 deg. F (65.6 deg. C), see subsection (2) of this section.

Note to (1)(a): The criteria for "safe for hot work" is located in the definition section, WAC 296-304-020(2).

(b) The certificate issued by the marine chemist or Coast Guard authorized person shall be posted in the immediate vicinity of the affected operations while they are in progress and kept on file for a period of at least three months from the date of the completion of the operation for which the certificate was generated.

(2) Hot work requiring testing by a competent person.

(a) Hot work is not permitted in or on the following spaces or adjacent spaces or other dangerous atmospheres until they have been tested by a competent person and determined to contain no concentrations of flammable vapors equal to or greater than 10 percent of the lower explosive limit:

(i) Dry cargo holds;

(ii) The bilges;

(iii) The engine room and boiler spaces for which a marine chemist or a Coast Guard authorized person certificate is not required under subsection (1)(a)(i) of this section; and

(iv) Vessels and vessel sections for which a marine chemist or Coast Guard authorized person certificate is not required under subsection (1)(a)(i) of this section; and

(v) Land-side confined and enclosed spaces or other dangerous atmospheres not covered by subsection (1)(a) of this section.

(b) If the concentration of flammable vapors or gases is equal to or greater than 10 percent of the lower explosive limit in the space or an adjacent space where the hot work is to be done, then the space shall be labeled "not safe for hot work" and ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration of flammable vapors or gases is below 10 percent by volume of the lower explosive limit. The warning label may be removed when the concentration of flammable vapors and gases are below 10 percent of the lower explosive limit.

Note to WAC 296-304-02007: See WAC 296-304-02013—Appendix A, for additional information relevant to performing hot work safely.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-02007, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02007, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-02007, filed 3/1/76; Order 74-25, § 296-304-02007, filed 5/7/74.]

WAC 296-304-02009 Maintenance of safe conditions. (1) Preventing hazardous materials from entering. Pipelines that could carry hazardous materials into spaces that have been certified "safe for workers" or "safe for hot work" shall be disconnected, blanked off, or otherwise blocked by a positive method to prevent hazardous materials from being discharged into the space.

(2) Alteration of existing conditions. When a change that could alter conditions within a tested confined or enclosed space or other dangerous atmosphere occurs, work in the affected space or area shall be stopped. Work may not be resumed until the affected space or area is visually inspected and retested and found to comply with WAC 296-304-02003, 296-304-02005, and 296-304-02007, as applicable.

Note to (2): Examples of changes that would warrant the stoppage of work include: The opening of manholes or other closures or the adjusting of a valve regulating the flow of hazardous materials.

(3) Tests to maintain the conditions of a marine chemist's or Coast Guard authorized person's certificates. A competent person shall visually inspect and test each space certified as "safe for workers" or "safe for hot work," as often as necessary to ensure that atmospheric conditions within that space is maintained within the conditions established by the certificate after the certificate has been issued.

(4) Change in the conditions of a marine chemist's or Coast Guard authorized person's certificate. If a competent person finds that the atmospheric conditions within a certified space fail to meet the applicable requirements of WAC 296-304-02003, 296-304-02005, and 296-304-02007, work in the certified space shall be stopped and may not be resumed until the space has been retested by a marine chemist or Coast Guard authorized person and a new certificate issued in accordance with WAC 296-304-02007(1).

(5) Tests to maintain a competent person's findings. After a competent person has conducted a visual inspection and tests required in WAC 296-304-02003, 296-304-02005, and 296-304-02007 and determined a space to be safe for an employee to enter, he or she shall continue to test and visually inspect spaces as often as necessary to ensure that the required atmospheric conditions within the tested space are maintained.

(6) Changes in conditions determined by competent person's findings. After the competent person has determined initially that a space is safe for an employee to enter and he or she finds subsequently that the conditions within the tested space fail to meet the requirements of WAC 296-304-02003, 296-304-02005, and 296-304-02007, as applicable, work shall be stopped until the conditions in the tested space are corrected to comply with WAC 296-304-02003, 296-304-02005, and 296-304-02007, as applicable.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-02009, filed 10/20/95, effective 1/16/96. Statutory

Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02009, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-02009, filed 3/1/76; Order 74-25, § 296-304-02009, filed 5/7/74.]

WAC 296-304-02011 Warning signs and labels. (1)

Employee comprehension of signs and labels. The employer shall ensure that each sign or label posted to comply with the requirements of this section is presented in a manner that can be perceived and understood by all employees.

(2) Posting of large work areas. A warning sign or label required by subsection (1) of this section need not be posted at an individual tank, compartment or work space within a work area if the entire work area has been tested and certified: "Not safe for workers," "not safe for hot work," and if the sign or label to this effect is posted conspicuously at each means of access to the work area.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02011, filed 1/18/95, effective 3/10/95; Order 74-25, § 296-304-02011, filed 5/7/74.]

WAC 296-304-02013 Appendix A—Compliance assistance guidelines for confined and enclosed spaces and other dangerous atmospheres. This appendix is a nonmandatory set of guidelines provided to assist employers in complying with the requirements of WAC 296-304-020 through 296-304-02011. This appendix neither creates additional obligations nor detracts from obligations otherwise contained in this chapter. It is intended to provide explanatory information and educational material to employers and employees to foster understanding of, and compliance with, this chapter.

WAC 296-304-020 through 296-304-02011. These standards are minimum safety standards for entering and working safely in vessel tanks and compartments.

WAC 296-304-020(2) Definition of "Hot work." There are several instances in which circumstances do not necessitate that grinding, drilling, abrasive blasting be regarded as hot work. Some examples are:

(1) Abrasive blasting of the hull for paint preparation does not necessitate pumping and cleaning the tanks of a vessel.

(2) Prior to hot work on any hollow structure, the void space should be tested and appropriate precautions taken.

WAC 296-304-020(2) Definition of "Lower explosive limit." The terms lower flammable limit (LFL) and lower explosive limit (LEL) are used interchangeably in fire science literature.

WAC 296-304-020(2) Definition of "Upper explosive limit." The terms upper flammable limit (UFL) and upper explosive limit (UEL) are used interchangeably in fire science literature.

WAC 296-304-02003(1) After a tank has been properly washed and ventilated, the tank should contain 20.8 percent oxygen by volume. This is the same amount found in our normal atmosphere at sea level. However, it is possible that the oxygen content will be lower. When this is the case, the reasons for this deficiency should be determined and corrective action taken.

An oxygen content of 19.5 percent can support life and is adequate for entry. However, any oxygen level less than 20.8 percent and greater than 19.5 percent level should also

alert the competent person to look for the causes of the oxygen deficiency and to correct them prior to entry.

WAC 296-304-02003(2) Flammable atmospheres. Atmospheres with a concentration of flammable vapors at or above 10 percent of the lower explosive limit (LEL) are considered hazardous when located in confined spaces. However, atmospheres with flammable vapors below 10 percent of the LEL are not necessarily safe.

Such atmospheres are too lean to burn. Nevertheless, when a space contains or produces measurable flammable vapors below the 10 percent LEL, it might indicate that flammable vapors are being released or introduced into the space and could present a hazard in time. Therefore, the cause of the vapors should be investigated and, if possible, eliminated prior to entry.

Some situations that have produced measurable concentrations of flammable vapors that could exceed 10 percent of the LEL in time are:

(1) Pipelines that should have been blanked or disconnected have opened, allowing product into the space.

(2) The vessel may have shifted, allowing product not previously cleaned and removed during washing to move into other areas of the vessel.

(3) Residues may be producing the atmosphere by releasing flammable vapor.

WAC 296-304-02003(2) Flammable atmospheres that are toxic. An atmosphere with a measurable concentration of a flammable substance below 10 percent of the LEL may be above the WISHA permissible exposure limit for that substance. In that case, refer to WAC 296-304-02003 (3)(b), (c), and (d).

WAC 296-304-02005 (2)(d), 296-304-02009(3), and 296-304-02009(5). The frequency with which a tank is monitored to determine if atmospheric conditions are being maintained is a function of several factors that are discussed below:

(1) Temperature. Higher temperatures will cause a combustible or flammable liquid to vaporize at a faster rate than lower temperatures. This is important since hotter days may cause tank residues to produce more vapors and that may result in the vapors exceeding 10 percent of the LEL or an overexposure to toxic contaminants.

(2) Work in the tank. Any activity in the tank could change the atmospheric conditions in that tank. Oxygen from a leaking oxyfuel hose or torch could result in an oxygen-enriched atmosphere that would more easily propagate a flame. Some welding operations use inert gas, and leaks can result in an oxygen-deficient atmosphere. Manual tank cleaning with high pressure spray devices can stir up residues and result in exposures to toxic contaminants. Simple cleaning or mucking out, where employees walk through and shovel residues and sludge, can create a change in atmospheric conditions.

(3) Period of time elapsed. If a period of time has elapsed since a marine chemist or Coast Guard authorized person has certified a tank as safe, the atmospheric condition should be rechecked by the competent person prior to entry and starting work.

(4) Unattended tanks or spaces. When a tank or space has been tested and declared safe, then subsequently left unattended for a period of time, it should be retested prior to entry and starting work. For example, when barges are left

unattended at night, unidentified products from another barge are sometimes dumped into their empty tanks. Since this would result in a changed atmosphere, the tanks should be retested prior to entry and starting work.

(5) Work break. When workers take a break or leave at the end of the shift, equipment sometimes is inadvertently left in the tanks. At lunch or work breaks and at the end of the shift are the times when it is most likely someone will leave a burning or cutting torch in the tank, perhaps turned on and leaking oxygen or an inert gas. Since the former can produce an oxygen-enriched atmosphere, and the latter an oxygen-deficient atmosphere, tanks should be checked for equipment left behind, and atmosphere, monitored if necessary prior to re-entering and resuming work. In an oxygen-enriched atmosphere, the flammable range is severely broadened. This means that an oxygen-enriched atmosphere can promote very rapid burning.

(6) Ballasting or trimming. Changing the position of the ballast, or trimming or in any way moving the vessel so as to expose cargo that had been previously trapped, can produce a change in the atmosphere of the tank. The atmosphere should be retested after any such move and prior to entry or work.

WAC 296-304-02007 (1) and (2) hot work. This is a reminder that other sections of the WISHA shipyard safety and health standards in chapter 296-304 WAC should be reviewed prior to starting any hot work. Most notably, WAC 296-304-040 through 296-304-04013, welding, cutting and heating, places additional restrictions on hot work: The requirements of WAC 296-304-04001 and 296-304-04005 must be met before hot work is begun on any metal that is toxic or is covered by a preservative coating respectively; the requirements of WAC 296-304-04007 must be met before welding, cutting, or heating is begun on any structural voids.

WAC 296-304-02003 (1)(b). During hot work, more than 20.8 percent oxygen by volume can be unsafe since it extends the normal flammable range. The standard permits the oxygen level to reach 22.0 percent by volume in order to account for instrument error. However, the cause of excess oxygen should be investigated and the source removed.

WAC 296-304-02011(2). If the entire vessel has been found to be in the same condition, then employers shall be considered to be in compliance with this requirement when signs using appropriate warning language in accordance with WAC 296-304-02011(1) are posted at the gangway and at all other means of access to the vessel.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02013, filed 1/18/95, effective 3/10/95.]

WAC 296-304-02015 Appendix B—Confined and enclosed spaces and other dangerous atmospheres in shipyard employment. This appendix provides a complete reprint of U.S. Coast Guard regulations as of October 1, 1993 referenced in WAC 296-304-020 for purposes of determining who is a Coast Guard authorized person.

(1) Title 46 CFR 35.01-1 (a) through (c) covering hot work on tank vessels reads as follows:

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, shall be used as a

guide in conducting the inspections and issuance of certificates required by this chapter.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(i) Within or on the boundaries of cargo tanks that have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or

(ii) Within or on the boundaries of fuel tanks; or

(iii) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(i) In ports or places in the United States or its territories and possessions, the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemists are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his/her contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection.

(ii) If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started.

(iii) Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified, throughout the operation and shall include such additional tests and certifications as considered required.

(iv) Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(2) Title 46 CFR 71.60(c)(1) covering hot work on passenger vessels reads as follows:

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, shall be used as a guide in conducting the inspections and issuance of certificates required by this chapter.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(i) Within or on the boundaries of cargo tanks which have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or

(ii) Within or on the boundaries of fuel tanks; or

(iii) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(i) In ports or places in the United States or its territories and possessions the inspection shall be made by a

marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his/her contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection.

(ii) If the inspection indicated that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started.

(iii) Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified throughout the operation and shall include such additional tests and certifications as considered required.

(iv) Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(3) Title 46 CFR 91.50-1(c)(1) covering hot work on cargo and miscellaneous vessels as follows:

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, shall be used as a guide in conducting the inspections and issuance of certificates required by this chapter.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(i) Within or on the boundaries of cargo tanks which have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or,

(ii) Within or on the boundaries of fuel tanks; or,

(iii) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(i) In ports or places in the United States or its territories and possessions the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his/her contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection.

(ii) If the inspection indicated that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started.

(iii) Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified throughout the operation and shall include such additional tests and certifications as considered required.

(iv) Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02015, filed 1/18/95, effective 3/10/95.]

WAC 296-304-03001 Toxic cleaning solvents. (1)

When toxic solvents are used, the employer shall employ one or more of the following measures to safeguard the health of employees exposed to these solvents.

(a) The cleaning operation shall be completely enclosed to prevent the escape of vapor into the working space.

(b) Either natural ventilation or mechanical exhaust ventilation shall be used to remove the vapor at the source and to dilute the concentration of vapors in the working space to a concentration which is safe for the entire work period.

(c) Employees shall be protected against toxic vapors by suitable respiratory protective equipment in accordance with the requirements of chapter 296-62 WAC, Part E and, where necessary, against exposure of skin and eyes to contact with toxic solvents and their vapors by suitable clothing and equipment.

(2) The principles in the threshold limit values to which attention is directed in WAC 296-304-02005 and applicable sections in chapter 296-62 WAC will be used by the department of labor and industries in enforcement proceedings in defining a safe concentration of air contaminants.

(3) When flammable solvents are used, precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-03001, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-03001, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-03001, filed 3/1/76; Order 74-25, § 296-304-03001, filed 5/7/74.]

WAC 296-304-03005 Mechanical paint removers.

(1) Power tools.

(a) Employees engaged in the removal of paints, preservatives, rusts or other coatings by means of power tools shall be protected against eye injury by goggles or face shields in accordance with the requirements of WAC 296-304-09001(1).

(b) All portable rotating tools used for the removal of paints, preservatives, rusts or other coatings shall be adequately guarded to protect both the operator and nearby workers from flying missiles.

(c) Portable electric tools shall be grounded in accordance with the requirements of WAC 296-304-08003 (1) and (2).

(d) In a confined space, mechanical exhaust ventilation sufficient to keep the dust concentration to a minimum shall be used, or employees shall be protected by respiratory protective equipment in accordance with the requirements of chapter 296-62 WAC, Part E.

(2) Flame removal.

(a) Hardened preservative coatings shall not be removed by flame in enclosed spaces unless the employees exposed to fumes are protected by air line respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

Employees performing such an operation in the open air, and those exposed to the resulting fumes, shall be protected by a fume filter type respirator in accordance with requirements of chapter 296-62 WAC, Part E.

(b) Flame or heat shall not be used to remove soft and greasy preservative coatings.

(3) Abrasive blasting.

(a) Equipment. Hoses and fittings used for abrasive blasting shall meet the following requirements:

(i) Hoses. Hose of a type to prevent shocks from static electricity shall be used.

(ii) Hose couplings. Hose lengths shall be joined by metal couplings secured to the outside of the hose to avoid erosion and weakening of the couplings.

(iii) Nozzles. Nozzles shall be attached to the hose by fittings that will prevent the nozzle from unintentionally becoming disengaged. Nozzle attachments shall be of metal and shall fit onto the hose externally.

(iv) Dead man control. A dead man control device shall be provided at the nozzle end of the blasting hose either to provide direct cutoff or to signal the pot tender by means of a visual and audible signal to cut off the flow, in the event the blaster loses control of the hose. The pot tender shall be available at all times to respond immediately to the signal.

(b) Replacement. Hoses and all fittings used for abrasive blasting shall be inspected frequently to insure timely replacement before an unsafe amount of wear has occurred.

(c) Personal protective equipment.

(i) Abrasive blasters working in enclosed spaces shall be protected by hoods and air fed respirators or by air helmets of a positive pressure type in accordance with the requirements of chapter 296-62 WAC, Part E.

(ii) Abrasive blasters working in the open shall be protected as indicated in (1) except that when synthetic abrasives containing less than one percent free silica are used filter type respirators approved by the Bureau of Mines for exposure to lead dusts may be used in accordance with chapter 296-62 WAC, Part E.

(iii) Employees, other than blasters, including machine tenders and abrasive recovery men, working in areas where unsafe concentrations of abrasive materials and dusts are present shall be protected by eye and respiratory protective equipment in accordance with the requirements of WAC 296-304-09001 (1) and (2) and chapter 296-62, Part E, respectively.

(iv) The blaster shall be protected against injury from exposure to the blast by appropriate protective clothing, including gloves.

(v) Since surges from drops in pressure in the hose line can be of sufficient proportions to throw the blaster off the staging, the blaster shall be protected by a safety belt and life line tied off to the ship or other structure when blasting is being done from elevations where adequate protection against falling cannot be provided by railings.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-03005, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-03005, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-03005, filed 3/1/76; Order 74-25, § 296-304-03005, filed 5/7/74.]

WAC 296-304-03007 Painting. (1) Paints mixed with toxic vehicles or solvents.

(a) When paints mixed with toxic vehicles or solvents are sprayed, the following conditions shall apply:

(i) In confined spaces, employees continuously exposed to such spraying shall be protected by air line respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

(ii) In tanks or compartments, employees continuously exposed to such spraying shall be protected by air line respirators in accordance with the requirements of chapter 296-62 WAC, Part E. Where mechanical ventilation is provided, employees shall be protected by respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

(iii) In large and well ventilated areas, employees exposed to such spraying shall be protected by respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

(b) Where brush application of paints with toxic solvents is done in confined spaces, or other areas where lack of ventilation creates a hazard, employees shall be protected by filter respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

(c) When flammable paints or vehicles are used, precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

(d) The metallic parts of air moving devices, including fans, blowers, and jet-type air movers, and all duct work shall be electrically bonded to the vessel's structure.

(2) Paints and tank coatings dissolved in highly volatile, toxic and flammable solvents. Several organic coatings, adhesives and resins are dissolved in highly toxic, flammable and explosive solvents with flash points below 80°F. Work involving such materials shall be done only when all of the following special precautions have been taken:

(a) Sufficient exhaust ventilation shall be provided to keep the concentration of solvent vapors below ten percent of the lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.

(b) If the ventilation fails or if the concentration of solvent vapors rises above ten percent of the lower explosive limit, painting shall be stopped and the compartment shall be evacuated until the concentration again falls below ten percent of the lower explosive limit. If the concentration does not fall when painting is stopped, additional ventilation to bring the concentration down to ten percent of the lower explosive limit shall be provided.

(c) Ventilation shall be continued after the completion of painting until the space or compartment is gas free. The final determination as to whether the space or compartment is gas free shall be made after the ventilating equipment has been shut off for a least ten minutes.

(d) Exhaust ducts shall discharge clear of working areas and away from sources of possible ignition. Periodic tests shall be made to ensure that the exhausted vapors are not accumulating in other areas within or around the vessel or dry dock.

(e) All motors and control equipment shall be of the explosion-proof type. Fans shall have nonferrous blades. Portable air ducts shall also be of nonferrous materials. All

motors and associated control equipment shall be properly maintained and grounded.

(f) Only nonsparking paint buckets, spray guns and tools shall be used. Metal parts of paint brushes and rollers shall be insulated. Staging shall be erected in a manner which ensures that it is nonsparking.

(g) Only explosion proof lights, approved by the Underwriters' Laboratories for use in Class I, Group D atmospheres, or approved as permissible by the U.S. Bureau of Mines or the U.S. Coast Guard, shall be used.

(h) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that there are no connections within fifty feet of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

(i) The face, eyes, head, hands and all other exposed parts of the bodies of employees handling such highly volatile paints shall be protected. All footwear shall be nonsparking, such as rubbers, rubber boots or rubber soled shoes without nails. Coveralls or other outer clothing shall be of cotton. Rubber, rather than plastic gloves shall be used because of the danger of static sparks.

(j) No matches, lighted cigarettes, cigars, or pipes, and no cigarette lighters or ferrous articles shall be taken into the area where work is being done.

(k) All solvent drums taken into the compartment shall be placed on nonferrous surfaces and shall be grounded to the vessel. Metallic contact shall be maintained between containers and drums when materials are being transferred from one to another.

(l) Spray guns, paint pots, and metallic parts of connecting tubing shall be electrically bonded, and the bonded assembly shall be grounded to the vessel.

(m) All employees continuously in a compartment in which such painting is being performed, shall be protected by air line respirators in accordance with the requirements of chapter 296-62 WAC, Part E and by suitable protective clothing. Employees entering such compartments for a limited time shall be protected by filter cartridge type respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

(n) All employees doing exterior paint spraying with such paints shall be protected by suitable filter cartridge type respirators in accordance with the requirements of chapter 296-62 WAC, Part E and by suitable protective clothing.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-03007, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-03007, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-03007, filed 3/1/76; Order 74-25, § 296-304-03007, filed 5/7/74.]

WAC 296-304-04001 Ventilation and protection in welding, cutting and heating. (1) Mechanical ventilation requirements.

(a) For the purposes of this section, mechanical ventilation shall meet the following requirements:

(i) Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.

(ii) General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits.

(iii) Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits.

(iv) Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.

(v) All air replacing that withdrawn shall be clean and respirable.

(vi) Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust or dirt from clothing, or for cleaning the work area.

(2) Welding, cutting and heating in confined spaces.

(a) Except as provided in WAC 296-304-04001 (2)(c) and (3)(b), either general mechanical or local exhaust ventilation meeting the requirements of (1) of this section shall be provided whenever welding, cutting or heating is performed in a confined space.

(b) The means of access shall be provided to a confined space and ventilation ducts to this space shall be arranged in accordance with WAC 296-304-05011 (2)(a) and (b).

(c) When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined space shall be protected by air line respirators in accordance with the requirements of chapter 296-62 WAC, Part E, and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

(3) Welding, cutting or heating of metals of toxic significance.

(a) Welding, cutting or heating in any enclosed spaces aboard the vessel involving the metals specified in this subsection shall be performed with either general mechanical or local exhaust ventilation meeting the requirements of (1) of this section.

(i) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.

(ii) Lead base metals.

(iii) Cadmium-bearing filler materials.

(iv) Chromium-bearing metals or metals coated with chromium-bearing materials.

(b) Welding, cutting, or heating in any enclosed spaces aboard the vessel involving the metals specified in this subsection shall be performed with local exhaust ventilation in accordance with the requirements of (1) of this section or employees shall be protected by air line respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

(i) Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials.

(ii) Cadmium-bearing or cadmium coated base metals.

(iii) Metals coated with mercury-bearing metals.

(iv) Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium shall be done with both local exhaust ventilation and air line respirators.

(c) Employees performing such operations in the open air shall be protected by filter type respirators in accordance with the requirements of WAC 296-304-09003, except that employees performing such operations on beryllium-containing base or filler metals shall be protected by air line

respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

(d) Other employees exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner.

(4) Inert-gas metal-arc welding.

(a) Since the inert-gas metal-arc welding process involves the production of ultraviolet radiation of intensities of 5 to 30 times that produced during shielded metal-arc welding, the decomposition of chlorinated solvents by ultraviolet rays, and the liberation of toxic fumes and gases, employees shall not be permitted to engage in, or be exposed to the process until the following special precautions have been taken:

(i) The use of chlorinated solvents shall be kept at least two hundred feet from the exposed arc, and surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is permitted on such surfaces.

(ii) Helpers and other employees in the area not protected from the arc by screening as provided in WAC 206-304-04011(5) shall be protected by filter lenses meeting the requirements of WAC 296-304-09001 (1) and (3). When two or more welders are exposed to each other's arc, filter lens goggles of a suitable type meeting the requirements of WAC 296-304-09001 (1) and (3) shall be worn under welding helmets or hand shields to protect the welder against flashes and radiant energy when either the helmet is lifted or the shield is removed.

(iii) Welders and other employees who are exposed to radiation shall be suitably protected so that the skin is covered completely to prevent burns and other damage by ultraviolet rays. Welding helmets and hand shields shall be free of leaks and openings, and free of highly reflective surfaces.

(iv) When inert-gas metal-arc welding is being performed on stainless steel, the requirements of (3)(b) of this section shall be met to protect against dangerous concentrations of nitrogen dioxide.

(5) General welding, cutting and heating.

(a) Welding, cutting and heating not involving conditions or materials described in (2), (3) or (4) of this section may normally be done without mechanical ventilation or respiratory protective equipment, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or respiratory protective equipment shall be provided.

(b) Employees performing any type of welding, cutting or heating shall be protected by suitable eye protective equipment in accordance with the requirements of WAC 296-304-09001 (1) and (3).

(6) Residues and cargos of metallic ores.

(a) Residues and cargos of metallic ores of toxic significance shall be removed from the area or protected from the heat before welding, cutting or heating is begun.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-04001, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-04001, filed 9/22/93, effective 11/1/93; Order 74-25, § 296-304-04001, filed 5/7/74.]

WAC 296-304-04005 Welding, cutting and heating in way of preservative coatings. (1) Before welding, cutting or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

(2) Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable they shall be stripped from the area to be heated to prevent ignition. A 1 1/2-inch or larger fire hose with fog nozzle, which has been uncoiled and placed under pressure, shall be immediately available for instant use in the immediate vicinity, consistent with avoiding freezing of the hose.

(3) Protection against toxic preservative coatings.

(a) In enclosed spaces all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application or the employees shall be protected by air line respirators meeting the requirements of chapter 296-62 WAC, Part E.

(b) In the open air employees shall be protected by a filter type respirator in accordance with the requirements of chapter 296-62 WAC, Part E.

(4) Before welding, cutting or heating is commenced in enclosed spaces on metals covered by soft and greasy preservatives, the following precautions shall be taken:

(a) A competent person shall test the atmosphere in the space to ensure that it does not contain explosive vapors, since there is a possibility that some soft and greasy preservatives may have flash points below temperatures which may be expected to occur naturally. If such vapors are determined to be present, no hot work shall be commenced until such precautions have been taken as will ensure that the welding, cutting or heating can be performed in safety.

(b) The preservative coatings shall be removed for a sufficient distance from the area to be heated to ensure that the temperature of the unstripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heated area may be used to limit the size of the area required to be cleaned. The prohibition contained in WAC 296-304-03005 (2)(b) shall apply.

(5) Immediately after welding, cutting or heating is commenced in enclosed spaces on metal covered by soft and greasy preservatives, and at frequent intervals thereafter, a competent person shall make tests to ensure that no flammable vapors are being produced by the coatings. If such vapors are determined to be present, the operation shall be stopped immediately and shall not be resumed until such additional precautions have been taken as are necessary to ensure that the operation can be resumed safely.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-04005, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-04005, filed 9/22/93, effective 11/1/93; Order 74-25, § 296-304-04005, filed 5/7/74.]

WAC 296-304-06013 Health and sanitation. (1) No chemical product, such as a solvent or preservative; no structural material, such as cadmium or zinc coated steel, or plastic material; and no process material, such as welding filler metal; which is a hazardous material within the

meaning of WAC 296-304-01001(21), shall be used until the employer has ascertained the potential fire, toxic, or reactivity hazards which are likely to be encountered in the handling, application, or utilization of such a material.

(2) In order to ascertain the hazards, as required by subsection (1) of this section, the employer shall obtain the following items of information which are applicable to a specific product or material to be used:

(a) The name, address, and telephone number of the source of the information specified in this section preferably those of the manufacturer of the product or material.

(b) The trade name and synonyms for a mixture of chemicals, a basic structural material, or for a process material; and the chemical name and synonyms, chemical family, and formula for a single chemical.

(c) Chemical names of hazardous ingredients, including, but not limited to, those in mixtures, such as those in: (i) Paints, preservatives, and solvents; (ii) alloys, metallic coatings, filler metals and their coatings or core fluxes; and (iii) other liquids, solids, or gases (e.g., abrasive materials).

(d) An indication of the percentage, by weight or volume, which each ingredient of a mixture bears to the whole mixture, and of the threshold limit value of each ingredient, in appropriate units.

(e) Physical data about a single chemical or a mixture of chemicals, including boiling point, in degrees Fahrenheit; vapor pressure, in millimeters of mercury; vapor density of gas or vapor (air=1); solubility in water, in percent by weight; specific gravity of material (water=1); percentage volatile, by volume, at 70°F.; evaporation rate for liquids (either butyl acetate or ether may be taken as 1); and appearance and odor.

(f) Fire and explosion hazard data about a single chemical or a mixture of chemicals, including flashpoint, in degrees Fahrenheit; flammable limits, in percent by volume in air; suitable extinguishing media or agents; special fire fighting procedures; and unusual fire and explosion hazard information.

(g) Health hazard data, including threshold limit value, in appropriate units, for a single hazardous chemical or for the individual hazardous ingredients of a mixture as appropriate, effects of overexposure; and emergency and first aid procedures.

(h) Reactivity data, including stability, incompatibility, hazardous decomposition products, and hazardous polymerization.

(i) Procedures to be followed and precautions to be taken in cleaning up and disposing of materials leaked or spilled.

(j) Special protection information, including use of personal protective equipment, such as respirators, eye protection, and protective clothing, and of ventilation, such as local exhaust, general, special, or other types.

(k) Special precautionary information about handling and storing.

(l) Any other general precautionary information.

(3) The pertinent information required by subsection (2) of this section shall be recorded either on United States Department of Labor Form LSB 00S-4, Material Safety Data Sheet, or on an essentially similar form which has been approved by the department of labor and industries. Copies of Form LSB 00S-4 may be obtained at any of the following

regional offices of the occupational safety and health administration:

(a) Pacific region. (Arizona, California, Hawaii, and Nevada.)

10353 Federal Building, 450 Golden Gate Avenue, Box 36017, San Francisco, Calif. 94102.

(b) Region X, OSHA, (Alaska, Washington, Idaho, and Oregon), Federal Office Building, 909 First Avenue, Seattle, Washington 98174.

A completed MSDS form shall be preserved and available for inspection for each hazardous chemical on the worksite.

(4) The employer shall instruct employees who will be exposed to the hazardous materials as to the nature of the hazards and the means of avoiding them.

(5) The employer shall provide all necessary controls, and the employees shall be protected by suitable personal protective equipment against the hazards identified under subsection (1) of this section and those hazards for which specific precautions are required in WAC 296-304-020 through 296-304-04013.

(6) The employer shall provide adequate washing facilities for employees engaged in the application of paints or coatings or in other operations where contaminants can, by ingestion or absorption, be detrimental to the health of the employees. The employer shall encourage good personal hygiene practices by informing the employees of the need for removing surface contaminants by thorough washing of hands and face prior to eating or smoking.

(7) The employer shall not permit eating or smoking in areas undergoing surface preparation or preservation or where shiprepairing, shipbuilding, or shipbreaking operations produce atmospheric contamination.

(8) The employer shall not permit employees to work in the immediate vicinity of uncovered garbage and shall ensure that employees working beneath or on the outboard side of a vessel are not subject to contamination by drainage or waste from overboard discharges.

(9) Requirements of chapter 296-62 WAC, Part C, hazard communication, will apply to shiprepairing, shipbuilding, and shipbreaking when potential hazards of chemicals and communicating information concerning hazards and appropriate protective equipment is applicable to an operation.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-06013, filed 1/18/95, effective 3/10/95; 88-14-108 (Order 88-11), § 296-304-06013, filed 7/6/88; Order 76-7, § 296-304-06013, filed 3/1/76; Order 74-25, § 296-304-06013, filed 5/7/74.]

WAC 296-304-08009 Powder actuated fastening tools. Powder actuated fastening tool operators shall comply with; and tools shall be designed, constructed, maintained and used in accordance with the requirements specified in chapter 296-24 WAC, Part H-1, general safety and health standards.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-08009, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-08009, filed 3/1/76; Order 74-25, § 296-304-08009, filed 5/7/74.]

Chapter 296-306 WAC
SAFETY STANDARDS FOR AGRICULTURE

WAC

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296-306-100	Handrails.
296-306-105	Ladders.
296-306-120	Aerial manlift equipment.
296-306-135	Arc welding and cutting.
296-306-140	Welding areas protected.
296-306-155	General requirements for maintenance of farm motor vehicles and equipment.
296-306-165	General requirements for all agricultural equipment.
296-306-170	Auger conveying equipment.
296-306-26001	Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.

WAC 296-306-010 Purpose and scope. (1) The standards in this chapter apply to all agricultural operations with one or more employees, when such employees are covered by the Washington Industrial Safety and Health Act (WISHA). Agriculture operations are defined as all operations necessary to farming and ranching, including maintenance of equipment and machinery, and planting, cultivating, growing or raising, keeping for sale, harvesting, or transporting on the farm or to the first place of processing any tree, plant, fruit, vegetable, animal, fowl, fish, or insects or products thereof. Agricultural operations include all employees in one or more of the following Standard Industrial Classification (SIC) Codes:

0111	Wheat
0115	Corn
0119	Cash Grains NEC, Barley, Peas, Lentils, Oats, etc.
0133	Sugar Cane and Sugar Beets
0134	Irish Potatoes - All Potatoes except Yams
0139	Field Crops - Hay, Hops, Mint, etc.
0161	Vegetables and Melons, All Inclusive
0171	All Berry Crops
0172	Grapes
0173	Tree Nuts
0175	Deciduous Tree Fruits
0179	Tree Fruits or Tree Nuts Not Elsewhere Classified
0181	Ornamental Floriculture and Nursery Products
0182	Food Crops Grown Under Cover

0191	General Farms, Primarily Crops
0211	Beef Cattle Feedlots
0212	Beef Cattle Except Feedlots - Cattle Ranches
0213	Hogs
0214	Sheep and Goats
0219	General Livestock Except Dairy and Poultry
0241	Dairy Farms
0251	Broiler, Fryer, and Roaster Chickens
0252	Chicken Eggs
0253	Turkeys and Turkey Eggs
0254	Poultry Hatcheries
0259	Poultry and Eggs Not Elsewhere Classified
0271	Fur Bearing Animals and Rabbits
0272	Horses
0273	Animal Aquaculture
0279	Animal Specialties Not Elsewhere Classified
0291	General Farms, Primarily Livestock and Animal Specialties
0711	Soil Preparation Services
0721	Crop Planting, Cultivating, and Protecting
0722	Crop Harvesting, Primarily by Machine
0751	Livestock Services, Except Veterinary
0761	Farm Labor Contractors
0811	Timber Tracts, Christmas Tree Growing, Tree Farms
0831	Forest Nurseries
0851	Forestry Services - Reforestation

(2) In the event that the provisions of this chapter conflict with the provisions contained in any other chapter of Title 296 WAC, this chapter shall prevail. Sections of chapter 296-24 WAC apply only when specifically referenced in this chapter.

(3) When employees are assigned to perform tasks other than those directly related to agricultural operations, the proper chapter of Title 296 WAC shall apply.

Note: Assignments may involve, but are not limited to activities, such as fruit and vegetable packing, logging, mining, sawmills, etc., when the products of such activities are removed from the farm site for commercial distribution.

(4) The requirement that the employer shall develop and maintain a hazard communication program as required by chapter 296-62 WAC, Part C which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed or may become exposed in the course of their employment, shall apply to chapter 296-306 WAC.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-010, filed 5/1/95, effective 1/16/96; 94-06-068 (Order 93-17), § 296-306-010, filed 3/2/94, effective 3/1/95; 93-07-012 (Order 92-24), § 296-306-010, filed 3/5/93, effective 6/1/93; 89-11-035 (Order 89-03), § 296-306-010, filed 5/15/89, effective 6/30/89; 88-14-108 (Order 88-11), § 296-306-010, filed 7/6/88. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-306-010, filed 7/31/79; Order 75-2, § 296-306-010, filed 1/24/75.]

WAC 296-306-012 Definitions applicable to all sections of this chapter.

Note: Meaning of words. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

"Approved" means approved by the director of the department of labor and industries or his/her authorized representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the Bureau of Mines, the provisions of WAC 296-24-006 shall apply.

"Authorized person" means a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective action to eliminate them.

"Department" means the department of labor and industries.

"Director" means the director of the department of labor and industries, or designated representative.

"Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: *Provided,* That any person, partnership, or business entity not having employees, and who is covered by the industrial insurance act shall be considered both an employer and an employee.

"Handling pesticides" means:

Mixing, loading, transferring, or applying pesticides.

Disposing of pesticides or pesticide containers.

Handling opened containers of pesticides.

Acting as a flagger.

Cleaning, adjusting, handling, or repairing the parts of mixing, loading, or application equipment that may contain pesticide residues.

Assisting with the application of pesticides.

Entering a treated area outdoors after application of any soil fumigant to adjust or remove soil coverings such as tarpaulins.

The term does not include any person who is only handling pesticide containers that have been emptied or cleaned according to pesticide product labeling instructions or, in the absence of such instructions, have been subjected to triple-rinsing or its equivalent.

"Hazard" means that condition, potential or inherent, which can cause injury, death, or occupational disease.

"Safety factor" means the ratio of the ultimate breaking strength of a member or piece of material or equipment to the actual working stress or safe load when in use.

"Shall" or "must" means mandatory.

"Should" or "may" means recommended.

"Standard safeguard" means a device designed and constructed with the object of removing the hazard of accident incidental to the machine, appliance, tool, building, or equipment to which it is attached.

Standard safeguards shall be constructed of either metal or wood or other suitable material or a combination of these.

The final determination of the sufficiency of any safeguard rests with the director of the department of labor and industries through his/her designated representative.

"Suitable" means that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

"Working day," for the purpose of appeals and accident reporting, means a calendar day, except Saturdays, Sundays, and legal holidays, as set forth in RCW 1.16.050, as now or hereafter amended, and for the purposes of the computation of time within which an act is to be done under the provisions of this chapter, shall be computed by excluding the first working day and including the last working day.

"Workmen," "personnel," "man," "person," "employee," and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, mean an employee of an employer who is employed in the business of his/her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is his/her personal labor for an employer whether by manual labor or otherwise.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-012, filed 5/1/95, effective 1/16/96; 94-06-068 (Order 93-17), § 296-306-012, filed 3/2/94, effective 4/15/94; 93-07-012 (Order 92-24), § 296-306-012, filed 3/5/93, effective 6/1/93. Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-012, filed 4/22/87.]

WAC 296-306-015 Variance procedures. (1) In the event some requirements of this agricultural safety standard become impractical under certain conditions, the director of the department of labor and industries may permit a variation from the requirements if the employer provides *equal protection* by other means and complies with the other requirements of chapter 49.17 RCW and chapter 296-350 WAC, variances.

(2) The written application must certify that the employer has properly notified his/her employees of his/her application for a variance. Proper notice to employees shall mean that a copy of the written application has been posted in a place or places reasonably accessible to all employees. In addition, a copy of the application shall be mailed to the authorized representative of such employees, if any. The notice shall advise employees and their representatives of their right to request the director to conduct a hearing on the variance application. All the above notices to employees must be made prior to the date the employer makes written application to the director.

Note: An employer who wishes to apply for a permanent or temporary variance shall make a request in writing to the Department of Labor and Industries, Division of Consultation and Compliance Services, P.O. Box 44620, Olympia, Washington, 98504-4620. The division will respond by furnishing application forms along with the instructions necessary to meet the intent of the law. A copy of chapter 296-350 WAC, variances will be included if specifically requested.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-015, filed 5/1/95, effective 1/16/96; 94-06-068 (Order 93-17), § 296-306-015, filed 3/2/94, effective 4/15/94; Order 75-2, § 296-306-015, filed 1/24/75.]

WAC 296-306-025 Management's responsibility. It shall be the responsibility of management to establish,

supervise, and enforce, in a manner which is effective in practice:

- (1) A safe and healthful working environment.
- (2) An accident prevention program as required by these standards.
- (3) A system for reporting and recording accidents that will fulfill statistical requirements of the department of labor and industries. (See chapter 296-27 WAC.)
- (4) Safety education and training programs.
- (5) Temporary labor camps, as prescribed in WAC 296-24-125 through 296-24-12523, and shall comply with these rules and regulations.
- (6) Safety marking and color coding for physical hazards required by this chapter and WAC 296-24-135 through 296-24-14011, Part B-2.
- (7) Sanitation for fixed places of employment as prescribed by WAC 296-24-120. The requirements of this subsection are not applicable to field sanitation. The shower requirements in WAC 296-24-12009(3) are not applicable to agricultural operations.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-025, filed 5/1/95, effective 1/16/96; 91-24-017 (Order 91-07), § 296-306-025, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-025, filed 4/22/87. Statutory Authority: RCW 49.17.040, 49.17.150 and 49.17.240. 79-08-115 (Order 79-9), § 296-306-025, filed 7/31/79; Order 77-12, § 296-306-025, filed 7/11/77; Order 75-2, § 296-306-025, filed 1/24/75.]

WAC 296-306-035 Accident prevention program.

- (1) The agricultural employer shall instruct all employees, including temporary and seasonal employees, in safe working practices. Such instruction shall be tailored to the types of hazards to which the employees will be exposed.
- (2) Each employer shall develop an accident prevention program tailored to the needs of the particular farm or agricultural operation and to the types of hazards involved.
- (3) Agricultural employers shall give appropriate safety instruction to seasonal employees and temporary crews at the beginning of employment.
- (4) The following are minimal program elements, for all agricultural employers, to be included in the safety orientation program:
 - (a) How, when, and where to report injuries and illnesses, and the location of first-aid facilities.
 - (b) How to report unsafe conditions and practices.
 - (c) The use and care of personal protective equipment.
 - (d) What to do in emergencies.
 - (e) Identification of hazardous chemicals or materials and the instruction for their safe use.
 - (f) An on-the-job review of the practices necessary to perform job assignments in a safe and healthful manner.

- (5) The accident prevention program shall be outlined in writing.
- (6) Every employer shall conduct foreman-crew safety meetings as follows:

- (a) Foreman-crew safety meetings shall be held at least monthly or whenever there are significant changes in job assignments. These meetings shall be tailored to the particular operation or activity occurring at the time.
- (b) Attendance shall be documented.
- (c) Subjects discussed shall be documented in the form of minutes.

(d) Short-term operations, such as harvesting, that lasts less than one week, do not require foreman-crew safety meetings but only require initial safety orientation for the operation.

(7) Minutes of each foreman-crew safety meeting shall be prepared and maintained at the location where the majority of employees report to work each day.

(8) Minutes for foreman-crew safety meetings shall be retained by employers for one year, and shall be made available upon request to personnel of the department of labor and industries.

(9) Every employer shall conduct at least monthly walk-around safety inspections of active jobsites, materials, and equipment involved and operating procedures.

(a) The walk-around safety inspections shall be conducted by a management representative.

(b) A representative chosen by employees shall be invited and allowed to accompany the management representative on the walk-around safety inspection.

(10) Lockout/tagout. The employer shall establish and (implement) a written program consisting of an energy control procedure (lockout/tagout), employee training, and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up, or release of stored energy could occur and cause injury, the machine, equipment, system, or process shall be isolated, and rendered inoperative. Whenever major replacement, repair, renovation, relocation, or modification of machines or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machines or equipment shall be designed to accept a lockout device. For lockout/tagout requirements not addressed by this chapter see WAC 296-24-110 through 296-24-119, Part A-4, general safety and health standards.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-035, filed 5/1/95, effective 1/16/96; 93-07-012 (Order 92-24), § 296-306-035, filed 3/5/93, effective 6/1/93; Order 75-2, § 296-306-035, filed 1/24/75.]

WAC 296-306-045 First-aid training and certification.

(1) One or more persons qualified to render first-aid shall be assigned to each farm or crew during working hours. "Qualified" means that the person holds a current certificate of first-aid training from the American Red Cross or other organizations, or agencies course of training with equivalent content and hours. A "current certificate" must be no more than three years old.

Note: A list of department approved first-aid courses can be obtained from your local department of labor and industries service location.

(2) The above requirement will be met if the farm operator or the spouse of the farm operator holds a current first-aid certificate and is available.

(3) The above requirements shall not apply to employees whose duties require them to be working alone at isolated work stations. However, they shall be checked at intervals by some method agreed upon by the employer and the employee.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-045, filed 5/1/95, effective 1/16/96; Order 75-2, § 296-306-045, filed 1/24/75.]

WAC 296-306-050 First-aid kit. (1) All employers covered by WISHA shall furnish first-aid kits as required by the department of labor and industries.

(2) First-aid supplies shall be readily accessible and provided for persons working alone at isolated stations.

Note: A ten-package kit shall contain at least the following items:

- 1 package 1-inch adhesive bandages (16 per package)
- 2 packages 4-inch bandage compress (1 per package)
- 1 package scissors and tweezers (1 each per package)
- 2 packages 40-inch triangular bandage (1 per package)
- 1 package antiseptic soap or pads (3 per package)
- 2 packages eye dressing (1 per package)
- 1 package 24" x 72" absorbent gauze (1 per package)

Note: Items may be added at employer's option.

(3) First-aid kit sizes and numbers shall be determined by the number of employees normally dependent upon each kit as outlined in the following table:

NUMBER OF EMPLOYEES NORMALLY ASSIGNED TO WORKSITE	MINIMUM FIRST-AID SUPPLIES REQUIRED AT WORKSITE
1 - 15 employees	1 ten-package kit
16 - 30 employees	2 ten-package kits or 1 24-package kit
31 - 50 employees	3 ten-package kits or 1 36-package kit
Over 50 employees (Within 1/2 mile radius)	First-aid Station - 136 package kit plus Stretcher and 2 blankets

Note: Kits may be carried in any motor vehicle when such vehicle is used near the crew. Such vehicles may be considered stations when so identified and when the driver is trained in first-aid.

(4) Items used from first-aid kits shall be replaced before the next shift. Kits shall be checked at least weekly for unauthorized removal of items.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-050, filed 5/1/95, effective 1/16/96; Order 75-2, § 296-306-050, filed 1/24/75.]

WAC 296-306-065 Materials handling and storage—General requirements. (1) Where mechanical handling equipment is used, safe clearances of three feet shall be allowed for aisles, loading docks, through doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstructions across or in aisles that could create hazards.

(2) Bags, bales, boxes and other containers stored in tiers shall be made secure against sliding or collapse.

(3) Storage areas shall be kept free from any accumulation of materials that could cause tripping, fire or explosion.

(4) Workers shall be instructed in proper lifting or moving techniques and methods. Mechanical devices or assistance in lifting shall be used when moving heavy objects.

(5) When removing materials from piles on horizontal surfaces, the face of the pile shall be removed in a manner that will prevent overhangs.

(6) Storage areas shall be provided with proper drainage.

(7) Clearance signs to warn of clearance limits shall be provided.

(8) Conveyors. Conveyors shall be constructed, operated and maintained in accordance with the provisions

of ANSI B 20.1-1957. The following additional provisions shall apply where applicable.

(a) When the return strand of a conveyor operates within seven feet of the floor there shall be a trough provided of sufficient strength to carry the weight resulting from a broken chain.

(b) If the strands are over a passageway a means shall be provided to catch and support the ends of the chain in the event of a break.

(c) When the working strand of a conveyor crosses within three feet of the floor level in passageways, the trough in which it works shall be bridged the full width of the passageway.

(d) Whenever conveyors pass adjacent to or over working areas or passageways used by personnel, protective guards shall be installed. These guards shall be designed to catch and hold any load or materials which may fall off or become dislodged and injure a worker.

(e) Employees shall not be allowed to walk on the rolls of roller-type conveyors except for emergency.

(f) Guards, screens or barricades of sufficient strength and size to prevent material from falling shall be installed on all sides of the shaftway of elevator-type conveyors except at openings where material is loaded or unloaded. Automatic shaftway gates or suitable barriers shall be installed at each floor level where material is loaded or unloaded from the platform.

(g) Conveyors shall be provided with an emergency stopping device which can be reached from the conveyor. Such device shall be located near the material entrance to each chopper, mulcher, saw, or similar type of equipment except where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance and is located where he/she cannot possibly fall onto the conveyor.

(h) Where conveyors are in excess of 7' in height, means shall be provided to safely permit essential inspection and maintenance operations.

(i) Any part showing signs of significant wear shall be inspected carefully and replaced prior to reaching a condition where it may create a hazard.

(j) Replacement parts shall be equal to or exceed the manufacturer's specifications.

(9) Powered industrial trucks (fork lifts). For powered industrial truck requirements, see WAC 296-24-230 through 296-24-23035, Part D.

(10) Changing and charging storage batteries.

(a) Battery changing installations shall be located in areas designated for that purpose.

(b) Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.

(c) When racks are used for support of batteries, they should be made of materials nonconductive to spark generation or be coated or covered to achieve this objective.

(d) A conveyor, overhead hoist, or equivalent material handling equipment shall be provided for handling batteries.

(e) Reinstalled batteries shall be properly positioned and secured in the vehicle.

(f) A carboy tilter or siphon shall be provided for handling electrolyte.

(g) When charging batteries, acid shall be poured into water; water shall not be poured into acid.

(h) Vehicles shall be properly positioned and brake applied before attempting to change or charge batteries.

(i) When charging batteries, the vent caps should be kept in place to avoid electrolyte spray. Care shall be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) shall be open to dissipate heat.

(j) Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.

(k) Tools and other metallic objects shall be kept away from the top of uncovered batteries.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-065, filed 5/1/95, effective 1/16/96; Order 75-2, § 296-306-065, filed 1/24/75.]

WAC 296-306-080 Guarding of hand-held portable power tools. (1) "Dead man" controls. Each hand-held, power-driven tool shall be provided with a "dead man" control, such as a spring-actuated switch, valve, or equivalent device, so that the power will be automatically shut off whenever the operator releases the control.

(2) Grounding. Electrical grounding requirements for portable machinery shall conform to the requirements of this section.

(a) The frames and all exposed, noncurrent-carrying metal parts of portable electric machinery operated at more than 50 volts to ground shall be grounded. Other portable motors driving electric tools which are held in the hand while being operated shall be grounded if they operate at more than 50 volts to ground. The ground shall be provided through use of a separate ground wire and polarized plug and receptacle.

(b) Double insulated tools which are designed and used in accordance with the requirements of Article 250-45 of the National Electrical Code (1971 edition) are exempted from the above grounding requirement in (a).

(3) Portable belt sanding machines. Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs onto a pulley. These guards shall effectively prevent the hands or fingers of the operator from coming in contact with the nip points.

(4) All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to covering position. Pruning and chain saws are exempt from this requirement.

(5) For hand-held powered tools and hand-held equipment requirements not typical to agriculture, see chapter 296-24 WAC, Part H-1, Hand and portable powered tools and other hand-held equipment.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-080, filed 5/1/95, effective 1/16/96; Order 75-2, § 296-306-080, filed 1/24/75.]

WAC 296-306-085 Fire protection and ignition sources.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-085, filed 5/1/95, effective 1/16/96; 88-14-108 (Order 88-11), § 296-306-085, filed 7/6/88; Order 75-2, § 296-306-085, filed 1/24/75.]

WAC 296-306-08501 Scope and application. (1) The requirements of WAC 296-306-085, Fire protection and ignition sources, apply to the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees. The selection and distribution requirements contained in WAC 296-306-08505 does not apply to the outside of workplaces, buildings or structures.

(2) For work place requirements not addressed by this chapter regarding means of egress and fire suppression equipment see chapter 296-24 WAC, Part G-1 and Part G-3.

(3) Where the employer has established and implemented the requirements of WAC 296-306-08509, emergency plan and fire protection, and extinguishers are not required by a specific standard administered by the department of labor and industries or other regulatory agency (ANSI, NFPA, or NEC) the employer is exempt from the requirements contained in WAC 296-306-08505, Selection and distribution.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-08501, filed 5/1/95, effective 1/16/96.]

WAC 296-306-08503 General requirements. (1) Portable fire extinguishers shall be tested, constructed, and used according to the National Fire Protection Association's pamphlet No. 10A-1970.

Note: The supplier of the extinguisher or local fire official can furnish this information.

(2) Fire extinguishing equipment shall be suitable for the hazard.

(3) The employer shall provide, locate, mount and identify portable fire extinguishers so that they are readily accessible to employees without subjecting the employees to possible injury.

(4) Each person expected to use fire extinguishing equipment shall be instructed upon initial employment and at least annually thereafter as to its proper use.

(5) Employees shall be instructed on procedures to be followed in case of fire.

(6) Areas where fire or explosion hazards exist shall be posted with no smoking or other suitable signs which warn of such hazards. Smoking shall be prohibited within fifty feet of all refueling operations. Precautions shall be taken to prevent open flames, sparks or electric arcs in refueling areas.

(7) Portable fire extinguishers shall be maintained in a fully charged and operable condition and kept in their designated places at all times except during use.

(8) Vaporizing type extinguishers such as carbon Tetrachloride and chlorobromomethane shall not be used.

(9) At least one portable fire extinguisher having a rating of not less than 12-B units shall be located outside of, but not more than 10 feet from the door opening into any room used for storage of flammables and or combustibles.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-08503, filed 5/1/95, effective 1/16/96.]

WAC 296-306-08505 Selection and distribution. (1) The employer shall distribute portable fire extinguishers for use by employees according to the following travel requirements:

(a) Travel distance to any Class A fire extinguisher is 75 feet (22.9 m) or less.

(b) Travel distance from the Class B hazard area to any extinguisher is 50 feet (15.2 m) or less.


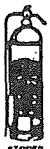













(c) Class C hazards may use appropriate pattern for the existing Class A or Class B hazards.

(d) The travel distance to portable fire extinguishers or other containers of Class D extinguishing agent for use by employees shall be 75 feet (22.9 m) or less. Class D

extinguishers are required in those combustible metal working areas where combustible metal powders, flakes, shavings, or similarly sized products are generated at least once every two weeks.

(2) The employer may use uniformly spaced standpipe systems or hose stations connected to a sprinkler system installed for emergency use by employees instead of Class A portable fire extinguishers, the system shall comply with the requirements of WAC 296-24-602 or 296-24-607, and they shall provide total coverage of the area to be protected, and that employees are trained at least annually in their use.

KNOW YOUR FIRE EXTINGUISHERS

	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL			
							SODIUM OR POTASSIUM BICARBONATE		MULTI-PURPOSE ABC	
										
CLASS A FIRES WOOD, PAPER, TRASH HAVING GLIMMING EMBERS 	YES	YES	YES	YES	YES	NO	NO	NO	YES	YES
CLASS B FIRES FLAMMABLE LIQUIDS, GASOLINE, OIL, PAINTS, GREASE, ETC. 	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
CLASS C FIRES ELECTRICAL EQUIPMENT 	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
CLASS D FIRES COMBUSTIBLE METALS 	SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES									
METHODS OF OPERATION	PULL PIN - SQUEEZE LEVER	TURN UP SIDE DOWN AND PUMP	PUMP HANDLE	TURN UP SIDE DOWN	TURN UP SIDE DOWN	PULL PIN - SQUEEZE LEVER	RUPTURE CARTRIDGE SQUEEZE LEVER	PULL PIN - SQUEEZE HANDLE	PULL PIN - SQUEEZE HANDLE	RUPTURE CARTRIDGE SQUEEZE LEVER
RANGE	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	3' - 8'	5' - 20'	5' - 20'	5' - 20'	5' - 20'
MAINTENANCE	CHECK AIR PRESSURE GAUGE MONTHLY	WEIGH GAS CARTRIDGE ADD WATER IF REQUIRED ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY RECHARGE	WEIGH SEAL ANNUALLY	WEIGH GAS CARTRIDGE CHECK CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	WEIGH GAS CARTRIDGE CHECK CONDITION OF DRY CHEMICAL ANNUALLY

Note: The special extinguishing agents chart can be used to determine suitable portable fire extinguishing equipment. The above department of labor and industries chart on special extinguishing agents approved by recognized testing laboratories is set forth as filed in the office of the code reviser. It is available for inspection in the code reviser's office as well as your local department of labor and industries.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-08505, filed 5/1/95, effective 1/16/96.]

WAC 296-306-08507 Inspection, maintenance and testing. (1) Portable extinguishers or hose shall be visually inspected monthly.

(2) The employer shall assure that portable fire extinguishers are subjected to an annual maintenance check. Stored pressure extinguishers do not require an internal examination. The employer shall record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less. The record shall be available to the director upon request.

(3) The employer shall assure that stored-pressure dry chemical extinguishers that require a twelve-year hydrostatic

test are emptied and subjected to applicable maintenance procedures every six years. Dry chemical extinguishers having nonrefillable disposable containers are exempt from this requirement. When recharging or hydrostatic testing is performed, the six-year requirement begins from that test date.

(4) The employer shall assure that alternate equivalent protection is provided when portable fire extinguishers are removed from service for maintenance and recharging.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-08507, filed 5/1/95, effective 1/16/96.]

WAC 296-306-08509 Employee emergency and fire prevention plans.

Note: Employee emergency and fire prevention plans can be part of the employers written accident prevention plan.

(1) Emergency action plan.

(a) The emergency action plan requirements shall be in writing, and shall cover those designated actions employers

and employees must take to ensure employee safety from fire and other emergencies.

(b) The following elements, at a minimum, shall be included in the plan:

(i) Emergency escape procedures and emergency escape route assignments;

(ii) Procedures to be followed by employees who remain to operate critical plant operations before they evacuate;

(iii) Procedures to account for all employees after emergency evacuation has been completed;

(iv) Rescue and medical duties for those employees who are to perform them;

(v) The preferred means of reporting fires and other emergencies; and

(vi) Names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under the plan.

(c) Alarm systems.

(i) The employer shall establish an employee alarm system which complies with WAC 296-24-631.

(ii) If the employee alarm system is used for alerting fire brigade members, or for other purposes, a distinctive signal for each purpose shall be used.

(d) The employer shall establish in the emergency action plan the types of evacuation to be used in emergency circumstances.

(e) Training.

(i) Before implementing the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.

(ii) The employer shall review the plan with each employee covered by the plan at the following times:

(A) Initially when the plan is developed;

(B) Whenever the employee's responsibilities or designated actions under the plan change; and

(C) Whenever the plan is changed.

(iii) The employer shall review with each employee upon initial assignment those parts of the plan which the employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and made available for employee review.

(2) Fire prevention plan.

(a) Elements. The following elements, at a minimum, shall be included in the fire prevention plan:

(i) A list of the major workplace fire hazards and their proper handling and storage procedures, potential ignition sources (such as welding, smoking and others) and their control procedures, and the type of fire protection equipment or systems which can control a fire involving them;

(ii) Names or regular job titles of those personnel responsible for maintenance of equipment and systems installed to prevent or control ignitions or fires; and

(iii) Names or regular job titles of those personnel responsible for control of fuel source hazards.

(b) Housekeeping. The employer shall control accumulations of flammable and combustible waste materials and residues so that they do not contribute to a fire emergency.

(c) Training.

(i) The employer shall apprise employees of the fire hazards of the materials and processes to which they are exposed.

(ii) The employer shall review with each employee upon initial assignment those parts of the fire prevention plan which the employee must know to protect the employee in the event of an emergency.

(d) Maintenance. The employer shall regularly and properly maintain, according to established procedures, equipment and systems installed on heat producing equipment to prevent accidental ignition of combustible materials.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-08509, filed 5/1/95, effective 1/16/96.]

WAC 296-306-090 Storage and handling of anhydrous ammonia. (1) Any agricultural employer or employee who transports or applies anhydrous ammonia shall obtain and comply with the anhydrous ammonia safety rules (WAC 296-24-51019 through 296-24-51021). These may be obtained from the department of labor and industries headquarters in Tumwater, Washington, or your local labor and industries service location.

(2) Gloves and goggles and/or a face shield shall be used by all employees while working on or with charged anhydrous ammonia equipment.

(3) Equipment shall be inspected before each day's work. Conditions that would contribute to accidental leakage shall be corrected.

(4) Hose end-valves must be in a closed position when not in use to prevent accidental discharge in case the main valve is opened.

(5) Five gallons or more of clean water must be provided on the equipment.

(6) Relief and vapor valves shall be positioned to discharge away from operator's working position.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-090, filed 5/1/95, effective 1/16/96; 88-14-108 (Order 88-11), § 296-306-090, filed 7/6/88; Order 75-2, § 296-306-090, filed 1/24/75.]

WAC 296-306-09001 Storage and handling of liquefied petroleum gases. (1) The storage and handling of liquefied petroleum gases shall comply with the requirements of chapter 296-24 WAC, Part F-1 Storage and handling of liquefied petroleum gases.

(2) Existing plants, appliances, equipment, buildings, structures, and installations for the storage, handling or use of LP-gas, which were in compliance with the current provisions of the National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases NFPA NO. 58-1972, 1973 at the time of manufacture or installation may be continued in use, if such continued use does not constitute a recognized hazard that is causing or is likely to cause death or serious physical harm to employees.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-09001, filed 5/1/95, effective 1/16/96.]

WAC 296-306-09003 Hazardous materials, flammable and combustible liquids, spray finishing, dip tanks. (1) General requirements.

(a) Storage, handling and marking of fuel. Fuel shall be stored, handled and marked in accordance with the recommendations specified by the National Fire Protection Association (NFPA) and/or other agencies having jurisdiction.

(b) Each employer shall determine that compressed gas cylinders under his/her control are in a safe condition to the extent that this can be determined by visual inspection. Visual and other inspections shall be conducted as prescribed in the hazardous materials regulations of the department of transportation (49 CFR Parts 171-179 and 14 CFR Part 103). Where those regulations are not applicable, visual and other inspections shall be conducted in accordance with *Compressed Gas Association Pamphlets C-6-1968 and C-8-1962*.

Note: This section is not applicable to pesticides. For hazards related to pesticides see Part M of this chapter.

(2) Compressed gas cylinders, portable tanks, and cargo tanks shall have pressure relief devices installed and maintained in accordance with Compressed Gas Association Pamphlets S-1.1-1963 and 1965 addenda and S-1.2-1963.

(3) Agricultural equipment employing open flames or equipment with integral containers, such as flame cultivators, weed burners, and, in addition, tractors, shall be shut down during refueling.

(4) Dip tanks shall comply with the requirements of WAC 296-24-405 through 296-24-40515, Part E.

(5) Spray finishing using flammable and combustible materials shall comply with the requirements of WAC 296-24-370, Part E.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-09003, filed 5/1/95, effective 1/16/96.]

WAC 296-306-095 Walking working surfaces, elevated walkways and platforms. (1) Elevated walkways, platforms and open-sided floors over 48 inches in height shall be guarded by safety railings.

(2) A standard railing shall consist of top rail, intermediate rail, and posts, and shall have a vertical height of from thirty-six to forty-two inches nominal from upper surface of top rail to floor, platform, runway, or ramp level and:

(a) The top rail shall be smooth-surfaced throughout the length of the railing.

(b) The intermediate rail shall be approximately halfway between the top rail and the floor, platform, runway, or ramp.

(c) The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.

(d) Guardrails with heights greater than 42 inches are permissible provided the extra height does not create a dangerous situation for employees and that additional midrails were installed so that openings beneath the top rail would not permit the passage of a 19-inch or larger spherical object.

(3) Railings may be omitted from particular sections of open-sided floors, platforms or walkways where guard rails impair operations.

(4) A stair railing shall be of construction similar to a standard railing but the vertical height shall be not more than thirty-four inches nor less than thirty inches from upper surface of top rail to surface of tread in line with face of riser at forward edge of tread.

(5) Minimum requirements for standard railings under various types of construction are specified in this subsection. Dimensions specified are based on the U.S. Department of Agriculture Wood Handbook, No. 72, 1955 (No. 1 (S4S) Southern Yellow Pine (Modulus of Rupture 7,400 p.s.i.) for wood; ANSI G 41.5-1970, American National Standard Specifications for Structural Steel, for structural steel; and ANSI B 125.1-1970, American National Standard Specifications for Welded and Seamless Steel Pipe, for pipe.

(a) For wood railings, the posts shall be of at least two-inch by four-inch nominal stock spaced not to exceed six feet; the top and intermediate rails shall be of at least two-inch by four-inch nominal stock. If top rail is made of two right-angle pieces of one-inch by four-inch stock, posts may be spaced on eight-foot centers, with two-inch by four-inch intermediate rail.

(b) For pipe railings, posts and top and intermediate railings shall be at least one and one-half inches nominal diameter (outside diameter) with posts spaced not more than eight feet on centers.

(c) For structural steel railings, posts and top and intermediate rails shall be of two-inch by two-inch by three-eighths-inch angles or other metal shapes of equivalent bending strength with posts spaced not more than eight feet on centers.

(d) The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least two hundred pounds applied in any direction at any point on the top rail.

(e) Other types, sizes, and arrangements of railing construction are acceptable provided they meet the following conditions:

(i) A smooth-surfaced top rail at a height above floor, platform, runway, or ramp level of from thirty-six to forty-two inches nominal;

(ii) A strength to withstand at least the minimum requirement of two hundred pounds top rail pressure;

(iii) Protection between top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail;

(iv) Elimination of overhang of rail ends unless such overhang does not constitute a hazard; such as, baluster railings, scrollwork railings, paneled railings.

(6) A standard toeboard shall be a minimum of four inches nominal in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and with not more than one-quarter-inch clearance above floor level. It may be made of any substantial material either solid or with openings not over one inch in greatest dimension.

(7) Toeboards shall be required on platforms with railing where objects falling from the platform could create a hazard to persons below.

(8) Where material is piled to such height that a standard toeboard does not provide protection, paneling from floor to intermediate rail, or to top rail shall be provided.

(9) Floor opening covers may be of any material that meets the following strength requirements:

(a) Trench or conduit covers and their supports, when located in plant roadways, shall be designed to carry a truck rear-axle load of at least twenty thousand pounds.

(b) Manhole covers and their supports, when located in plant roadways, shall comply with local standard highway requirements if any; otherwise, they shall be designed to carry a truck rear-axle of at least twenty thousand pounds.

(c) The construction of floor opening covers may be of any material that meets the strength requirements. Covers projecting not more than one inch above the floor level may be used providing all edges are chamfered to an angle with the horizontal of not over thirty degrees. All hinges, handles, bolts, or other parts shall set flush with the floor or cover surface.

(10) Stairway construction requirements shall comply with WAC 296-24-765 through 296-24-76555.

(11) Guarding of floors, wall openings and holes not covered in this chapter shall comply with the requirements of WAC 296-24-750 through 296-24-75011.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-095, filed 5/1/95, effective 1/16/96; Order 75-2, § 296-306-095, filed 1/24/75.]

WAC 296-306-100 Handrails. (1) Each fixed stairway with four or more risers, used by employees, shall be equipped with a handrail.

(2) A handrail shall consist of a lengthwise member mounted directly on a wall or partition by means of brackets attached to the lower side of the handrail so as to offer no obstruction to a smooth surface along the top and both sides of the handrail. The handrail shall be of rounded or other section that will furnish an adequate handhold for anyone grasping it to avoid falling. The ends of the handrail should be turned in to the supporting wall or otherwise arranged so as not to constitute a projection hazard.

(3) The height of handrails shall be not more than thirty-four inches nor less than thirty inches from upper surface of handrail to surface of tread in line with face of riser or to surface of ramp.

(4) The mounting of handrails shall be such that the completed structure is capable of withstanding a load of at least two hundred pounds applied in any direction at any point on the rail.

(5) The size of handrails shall be: When of hardwood, at least two inches in diameter; when of metal pipe, at least one and one-half inches in diameter. The length of brackets shall be such as will give a clearance between handrail and wall or any projection thereon of at least one and one-half inches. The spacing of brackets shall not exceed eight feet.

(6) All handrails and railings shall be provided with a clearance of not less than one and one-half inches between the handrail or railing and any other object.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-100, filed 5/1/95, effective 1/16/96; Order 75-2, § 296-306-100, filed 1/24/75.]

WAC 296-306-105 Ladders. (1) General requirements.

(a) Ladders shall be inspected prior to being used.

(b) Ladders shall be maintained in good condition at all times. Joints between steps and side rails shall be tight. All hardware and fittings shall be securely attached, and the moveable parts shall operate freely without binding or undue play.

(c) Employees shall not ascend or descend ladders while carrying tools or materials which will interfere with the free use of both hands.

(d) Ladders which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "dangerous, do not use."

(e) Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height.

(f) Ladders carried on vehicles should be adequately supported to avoid sagging and securely fastened in position to minimize chafing and the effects of road shocks.

(g) Portable ladders shall be so placed that the side rails have a secure footing. The top rest for portable rung and cleat ladders shall be reasonably rigid and shall have ample strength to support the applied load.

(h) Employers shall not require or direct employees to stand on the top two steps of the orchard ladder.

(i) Ladders made by fastening cleats across a single rail shall not be used.

(j) Stepladders shall not be used as single ladders.

(k) When working from a ladder over twenty-five feet from the ground or floor, the ladder shall be secured at both top and bottom.

(l) No type of work shall be performed on a ladder over twenty-five feet from the ground or floor that requires the use of both hands to perform the work, unless a safety belt is worn and the safety lanyard is secured to the ladder.

(m) Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty equipment shall not be used; improvised repairs shall not be made.

(n) Ladders shall where necessary have the feet of the ladder equipped with steel points or other nonslipping base designed for the surface on which it will be used.

(2) Care of ladders.

(a) Ladders shall be handled with care and not subject to unnecessary dropping, jarring, or misuse. (They are designed for a specific purpose or use; therefore, any variation from this use constitutes a mishandling of the equipment.)

(b) Complete ladder inspection shall be periodical. If a ladder is involved in any of the following, immediate inspection is necessary:

(i) If ladders tip over, inspect ladder for side rails dents or bends, or excessively dented rungs; check all rung-to-side-rail connections; check hardware connections; check rivets for shear.

(ii) If ladders are exposed to excessive heat as in the case of fire, the ladder should be inspected visually for damage and tested for deflection and strength characteristics. In doubtful cases, refer to manufacturer.

(c) Ladders having defects are to be marked and taken out of service until repaired by either maintenance department or the manufacturer.

(d) Ladder storage shall:

(i) Be designed to protect the ladder when not in use;

(ii) Have sufficient supporting points to prevent any possibility of excessive sagging;

(iii) Provide ease of access or inspection; and

(iv) Prevent danger of accident when withdrawing a ladder for use.

(3) Training and use of ladders.

(a) At the beginning of employment, employers shall provide employees with orientation and training on the proper use of ladders, including how to set a ladder and properly dismount with a full load.

(b) Employers shall instruct employees to not overreach while standing on the ladder to prevent ladder upset.

(c) Employers shall instruct employees that before climbing ladders, rungs, shoes and/or boots shall be free and clean of any substance which would make them hazardous.

(4) Use of orchard ladders.

(a) Orchard ladders longer than sixteen feet shall not be used.

(b) Employers shall instruct employees to not stand on the top two steps (the top cap and the next step down) of orchard type ladders.

(c) Employers shall instruct employees to not step off the ladder onto branches of trees except onto the main crotch of the tree.

(5) Miscellaneous ladder requirements.

(a) Wood ladders, when not in use, should be stored at a location where they will not be exposed to the elements, but where there is good ventilation. They shall not be stored near radiators, stoves, steam pipes, or other places subjected to excessive heat or dampness.

(b) Wooden ladders should be kept coated with a suitable protective material. The painting of ladders is satisfactory providing the ladders are carefully inspected prior to painting by competent and experienced inspectors acting for, and responsible to, the purchaser, and providing the ladders are not for resale.

(c) Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.

(d) Ladder safety devices. Ladder safety devices may be used on tower, water tank and chimney ladders over twenty feet in unbroken length in lieu of cage protection. No landing platform is required in these cases. All ladder safety devices such as those that incorporate lifelines, friction brakes, and sliding attachments shall meet the design requirements of the ladders which they serve.

(e) The top of the ladder must be placed with the two rails supported, unless equipped with a single support attachment. Such an attachment should be substantial and large enough to support the ladder under load.

(f) See chapter 296-24 WAC Part L for work practices to be used when work is performed on or near electrical circuits.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-105, filed 5/1/95, effective 1/16/96; 93-07-012 (Order 92-24), § 296-306-105, filed 3/5/93, effective 6/1/93; Order 75-2, § 296-306-105, filed 1/24/75.]

WAC 296-306-120 Aerial manlift equipment. (1)

Safety factor test data on working or structural components submitted by the manufacturer, by a competent testing laboratory, by a registered engineering firm or a registered engineer shall be acceptable evidence that the manlift meets minimum safety requirements. If, however, through use, a reasonable doubt arises as to whether or not this equipment will meet the above requirements, a designated representative of the department of labor and industries may require that

appropriate tests be conducted and may order any corrections indicated.

(2) Working brake systems shall be on all aerial manlifts.

(3) Automatic restrictive orifices shall be installed in the hydraulic systems of aerial manlifts to maintain the boom in position in case any part of the hydraulic pressure system should fail.

(4) Controls shall be guarded by partial enclosures in order to minimize the chances of accidental contact.

(5) The manufacturer's recommended maximum load limit shall be posted at a conspicuous place near the controls and shall be kept in a legible condition.

(6) The manufacturer's instructional manual, if any, shall be used to establish the proper operational sequences and maintenance procedures. If such a manual does not exist, the employer shall develop the necessary instructions. The instructions shall be available for reference by operators.

(7) A daily visual inspection and the tests in accordance with the manufacturer's recommendations shall be made by the assigned operator.

(8) Only workers qualified by reason of training or experience shall be permitted to operate aerial manlifts.

(9) Defective aerial manlift equipment shall be reported to the employer or his/her designated representative as soon as identified. The use of defective equipment is prohibited when the defect may cause an accident.

(10) When moving to and from the job site, the basket of the manlift shall be in the low position.

(11) Unsafe practices, including but not limited to, sitting or standing on the basket edge, standing on material placed across the basket, or working from a ladder set inside the basket, are prohibited.

(a) The basket shall not be rested on a fixed object in such a way that the weight of the boom is supported by the basket.

(b) The employee or any part of agricultural aerial manlift equipment shall not come closer to high voltage lines than the requirements set forth in WAC 296-306-14511 Proximity to overhead lines.

(12) All critical hydraulic and pneumatic components shall comply with the provisions of the American National Standards Institute Standard, ANSI A92.2-1969, Section 4.9 Bursting Safety Factor. Critical components are those which a failure would result in a free fall or free rotation of the boom. All noncritical components shall have a bursting safety factor of at least two to one.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-120, filed 5/1/95, effective 1/16/96; 94-06-068 (Order 93-17), § 296-306-120, filed 3/2/94, effective 4/15/94; Order 75-2, § 296-306-120, filed 1/24/75.]

WAC 296-306-135 Arc welding and cutting. Manual electrode holders.

(1) Only manual electrode holders which are specifically designed for arc welding and cutting, and capable of safely handling the maximum rated current required by the electrodes, shall be used.

(2) Any current-carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder,

shall be fully insulated against the maximum voltage encountered to ground.

(3) When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

(4) Welding and cutting requirements not addressed by this chapter can be located in chapter 296-24 WAC, Part I.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-135, filed 5/1/95, effective 1/16/96; Order 75-2, § 296-306-135, filed 1/24/75.]

WAC 296-306-140 Welding areas protected. Areas in which welding is being done shall be screened or barricaded to protect persons from flash burns, when practical and adequate ventilation provided. If the welding process cannot be isolated, all persons who may be exposed to the hazard of arc flash shall wear goggles or glasses with side shields that have tinted lenses meeting the requirements of WAC 296-306-060, Personal protective equipment.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-140, filed 5/1/95, effective 1/16/96; Order 75-2, § 296-306-140, filed 1/24/75.]

WAC 296-306-155 General requirements for maintenance of farm motor vehicles and equipment. (1) Before any person performs service or repair work under hydraulic or mechanical raised dump truck beds, blades, discs, etc., that raised portion of the equipment shall be manually pinned or blocked to prevent falling.

(2) Inflation of tires. Unmounted split-rim wheels shall be placed in a safety cage or other safety device which will prevent a split-rim from striking the worker if it should dislodge while the tire is being inflated. For requirements relating to servicing of multipiece and single-piece rim wheels see WAC 296-24-217 through 296-24-21713, Part D.

(3) If a motor vehicle or other farm equipment is in an unsafe condition to operate, the operator shall report the suspected condition immediately to the person in charge. If any defect would make the vehicle or equipment unsafe to operate under existing conditions, the vehicle or equipment shall be removed from service by the person in charge and repaired before being used.

(4) Vehicles shall not be driven at speeds which exceed that which is safe under existing conditions.

(5) Motors shall be shut off prior to refueling. Care shall be taken to prevent fuel from spilling on hot parts.

(6) The requirements of WAC 296-24-233, "Motor vehicle trucks and trailers" shall apply to this chapter.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-155, filed 5/1/95, effective 1/16/96; Order 75-2, § 296-306-155, filed 1/24/75.]

WAC 296-306-165 General requirements for all agricultural equipment. (1) Definitions.

(a) "Agricultural equipment" means equipment used in production or handling of agricultural products.

(b) "Agricultural field equipment" means tractors, self-propelled implements, implements and combinations thereof used in agricultural operations.

(c) "Agricultural tractor" means a two-wheel or four-wheel drive type vehicle, or a track vehicle, of more than twenty net engine horsepower (continuous brake power rating per Society of Automotive Engineers (SAE) J816b -

or the power recommended by the manufacturer for satisfactory operation under the manufacturer specified continuous duty conditions), designed to furnish the power to pull, carry, propel, or drive implements that are designed for agriculture. All self-propelled implements are excluded.

(d) "Augers" means screw conveyors and related accessories designed primarily for conveying agricultural materials on farms.

(e) "Constant-running drives" means those drives which continue to rotate when the engine is running. (With all clutches disengaged.)

(f) "Farm field equipment" means tractors or implements, including self-propelled implements, or any combination thereof used in agricultural operations.

(g) "Farmstead equipment" means agricultural equipment normally used in a stationary manner. This includes, but is not limited to, materials handling equipment and accessories for such equipment whether or not the equipment is an integral part of a building.

(h) "Guarding by location" means a component may be considered guarded by location when, because of its location, it does not present a hazard during operation or maintenance. A component seven feet or more above a working surface is considered guarded by location.

(i) "Ground-drive equipment" means equipment using power supplied by its pulled wheels to move gears, chains, sprockets, belts, pulleys, augers, tines, etc.

(j) "Low profile tractor" means a wheel or track equipped vehicle possessing the following characteristics:

(i) The front wheel spacing is equal to the rear wheel spacing, as measured from the centerline of each right wheel to the centerline of the corresponding left wheel.

(ii) The clearance from the bottom of the tractor chassis to the ground does not exceed eighteen inches.

(iii) The highest point of the hood does not exceed sixty inches, and

(iv) The tractor is designed so that the operator straddles the transmission when seated.

(k) A "guard" or "shield" is a barrier which insures that no part of an employee may come into contact with a hazard created by a moving machinery part.

(l) "Point of operation" means the area on a machine where work is actually performed upon the material being processed.

(m) "Power take-off shafts" are the shafts and knuckles between the tractor, or other power source, and the first gear set, pulley, sprocket, or other components on power take-off shaft driven equipment.

(2) Immediate priority shall be given to guarding of power take-off drives on all tractors and equipment. These must be guarded no later than January 1, 1976.

(3) All other power transmission components must be guarded on all equipment manufactured on or after January 1, 1976.

(4) If unguarded power transmission components on older field equipment show evidence that they were once guarded, the guards shall be replaced by January 1, 1976.

(5) The manufacturer's instruction manual, if published by the manufacturer and currently available, shall be the source of information for the safe operation and maintenance of field equipment.

(6) Operating instructions. At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all covered equipment with which he/she is or will be involved, including at least the following safe operating practices:

(a) Keep all guards in place when the machine is in operation;

(b) Passengers, other than persons required for instruction or machine operation shall not be permitted to ride on equipment unless a passenger seat or other protective device is provided.

(c) Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning, or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment;

(d) Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine;

(e) Lock out electrical power before performing maintenance or service on farmstead equipment.

(7) Methods of guarding. Except as otherwise provided in this chapter, each employer shall protect employees from coming into contact with moving machinery parts as follows:

(a) Through the installation and use of a guard or shield or guarding by location;

(b) Whenever a guard or shield or guarding by location is infeasible, by using a guardrail or fence.

(8) Strength and design of guards.

(a) Where guards are used to provide the protection required by this section, they shall be designed and located to prevent inadvertent contact with the hazard being guarded.

Note: Minimum requirements for guards shall correspond to Table K-1 below.

(b) Unless otherwise specified, each guard and its supports shall be capable of withstanding the force that a two hundred fifty pound individual, leaning on or falling against the guard, would exert upon that guard.

(c) Guards shall be free from burrs, sharp edges, and sharp corners, and shall be securely fastened to the equipment or building.

TABLE K-1

Material	Clearance From Moving Parts at all Points (inches)	Largest Mesh or Opening Allowable (inches)	Minimum Gauge (U.S. Standard) or Thickness
Woven Wire	under 2	3/8	No. 16 Gauge
	2-4	1/2	No. 16 Gauge
	4-15	2	No. 12 Gauge
Expanded Metal	under 4	1/2	No. 18 Gauge
	4-15	2	No. 13 Gauge
Perforated Metal	under 4	1/2	No. 20 Gauge
	4-15	2	No. 14 Gauge
Sheet Metal	under 15		No. 22 Gauge

Plastic

under 15

Tensile strength of 10,000 lb/in²

(9) Guarding by railings. Guardrails or fences shall be capable of preventing employees from inadvertently entering the hazardous area.

(10) Servicing and maintenance. Whenever a moving machinery part presents a hazard during servicing or maintenance, the engine shall be stopped, the power source disconnected, and all machine movement stopped before servicing or maintenance is performed, except where the employer can establish that:

(a) The equipment must be running to be properly serviced or maintained;

(b) The equipment cannot be serviced or maintained while a guard or guards are in place; and

(c) The servicing or maintenance is safely performed.

(11) Shields, guards and access doors that will prevent accidental contact with rotating machine parts on constant-running drives shall be in place when the machine is running. This requirement shall not apply to combines where such guards could create fire hazards.

(12) A guard or shield on stationary equipment shall be provided at the mesh point or pinch point where the chain or belt contacts the sprocket or pulley. Revolving shafts shall be guarded by a standard safeguard unless guarded by location. Shafts that protrude less than one-half the outside diameter of the shaft are exempt from this section.

(13) Projections, such as exposed bolts, keys, or set screws on sprockets, sheaves or pulleys on stationary equipment shall be shielded unless guarded by location.

(14) Miscellaneous general requirements:

(a) Machines which are of a type that will throw stock, material, or objects shall be covered or provided with a device designed and constructed to minimize this action. (Such machines as rip saws, rotary mowers and beaters, rotary tillers are a few in this classification.)

(b) When the periphery of the blades of a fan is less than seven feet above the floor or working level, the blades shall be guarded. The guard shall have openings no larger than one-half inch.

(15) Machine controls.

(a) If the operation of a machine requires the presence of an operator on the machine, a power control device shall be provided on each machine to enable the operator to stop the machine or machine feed without leaving his/her position.

(b) Power control devices whose function is not readily self-evident to a casual observer shall be marked to indicate their function and the machine which they control. The position of ON and OFF shall be indicated.

(c) "Stop" buttons shall be colored red or orange. Each machine shall have one or more stop buttons according to the working position of the operator or operators.

(d) Machine control devices shall be located or guarded to prevent unexpected or accidental movement of the control. Electrical switch "start" buttons shall be recessed.

(16) Steam pipes.

(a) All steam pipes or pipes heated by any other means to a sufficient temperature to burn a person (other than coil pipes, radiators, for heating rooms or buildings, or pipes on

portable steam engines and boilers) and which are within seven feet of a floor or platform, if exposed to contact, shall be guarded with a standard safeguard.

(b) Protection from hot pipes. All exposed hot pipes within seven feet of the floor or working platform, or within 15 inches measured horizontally from stairways, ramps or fixed ladders, shall be covered with an insulating material or be guarded in such a manner as to prevent contact.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-165, filed 5/1/95, effective 1/16/96; 93-07-012 (Order 92-24), § 296-306-165, filed 3/5/93, effective 6/1/93; 91-24-017 (Order 91-07), § 296-306-165, filed 11/22/91, effective 12/24/91; 89-11-035 (Order 89-03), § 296-306-165, filed 5/15/89, effective 6/30/89; Order 76-28, § 296-306-165, filed 9/28/76; Order 75-2, § 296-306-165, filed 1/24/75.]

WAC 296-306-170 Auger conveying equipment. (1)

Scope. This section applies only to farm augers as defined in WAC 296-306-165 (1)(d).

(2) General specifications.

(a) All shields and guards shall conform to WAC 296-306-165(13).

(b) Power take off shaft guards shall conform to WAC 296-306-165(8).

(3) Specifications.

(a) Each sweep auger shall have its top half shielded by a guard. No opening in such guard shall exceed 4 3/4 inches in length or width.

(b) The exposed auger at the hopper and the intake shall be guarded or otherwise designed to provide a deterrent from accidental contact with the rotating inlet area and extend a minimum of 2 1/2 inches above and below the exposed auger. Openings in the guard, for the free flow of material, shall not exceed 4 3/4 inches in length or width and shall be of sufficient strength to support a concentrated weight of 250 pounds at mid span.

(c) The hand raising winch shall be provided with a control which will hold the auger at any angle of inclination, and respond only to handle actuation. It shall not be necessary to disengage such control to lower the auger. The force required on the handle to raise or lower the auger manually shall not exceed 50 pounds.

(d) The wire rope lifting pulleys shall be grooved to fit the wire rope with which they are used.

(e) In order to avoid separation, a positive restraint shall be provided between the auger tube and the under-carriage lifting arm. Stops that restrict the maximum raised angle and minimum lowered angle shall be provided.

(f) Wire ropes (cables) shall be rust resistant and selected for the design load and service intended.

(g) Service and operation instructions provided the equipment operator shall include those basic practices for safe operation and servicing.

(4) All augers shall be covered or guarded when exposed to contact.

(5) Equipment manufactured after October 25, 1976, shall be guarded in compliance with the following specification:

(a) Sweep arm material gathering mechanisms used on the top surface of materials within silo structures shall be guarded. The lower or leading edge of the guard shall be located no more than 12 inches above the material surface and no less than 6 inches in front of the leading edge of the

rotating member of the gathering mechanism. The guard shall be parallel to, and extend the fullest practical length of the material gathering mechanism.

(b) Exposed auger flighting on portable grain augers shall be guarded with either grating type guards or solid baffle style covers as follows:

(i) The largest dimensions or openings in grating type guards through which materials are required to flow shall be 4 3/4 inches. The area of each opening shall be no larger than 10 square inches. The opening shall be located no closer to the rotating flighting than 2 1/2 inches.

(ii) Slotted openings in solid baffle style covers shall be no wider than 1 1/2 inches, or closer than 3 1/2 inches to the exposed flighting.

(iii) Openings larger than those specified in (i) and (ii) of this subdivision may be permitted if necessary to permit the free flow of material which has a tendency to bridge over. Such opening shall be no larger than that required for proper functioning of the auger. In any case, the guard shall be designed, arranged or located so that no part of a worker's person or appendage may contact the auger flighting.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-170, filed 5/1/95, effective 1/16/96; Order 76-28, § 296-306-170, filed 9/28/76; Order 75-2, § 296-306-170, filed 1/24/75.]

WAC 296-306-26001 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.

(1) Definitions. For purposes of this section, "vehicle weight" means the manufacturer's maximum weight of the prime mover for rubber-tired self-propelled scrapers. For other types of equipment to which this section applies, "vehicle weight" means the manufacturer's maximum recommended weight of the vehicle plus the heaviest attachment.

(2) General.

(a) This section prescribes minimum performance criteria for rollover protective structures (ROPS) for rubber-tired self-propelled scrapers; rubber-tired front-end loaders and rubber-tired dozers; crawler tractors, and crawler-type loaders, and motor graders. The vehicle and ROPS as a system shall have the structural characteristics prescribed in subsection (7) of this section for each type of machine described in this subsection.

(3) The static laboratory test prescribed herein will determine the adequacy of the structures used to protect the operator under the following conditions:

(a) For rubber-tired self-propelled scrapers, rubber-tired front-end loaders, and rubber-tired dozers: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 30° maximum.

(b) For motor graders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to 360° down a slope of 30° maximum.

(c) For crawler tractors and crawler-type loaders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 45°.

(4) Facilities and apparatus.

(a) The following material is necessary:

(i) Material, equipment, and tiedown means adequate to ensure that the ROPS and its vehicle frame absorb the applied energy.

(ii) Equipment necessary to measure and apply loads to the ROPS. Adequate means to measure deflection and lengths should also be provided.

(iii) Recommended, but not mandatory, types of test setups are illustrated in Figure C-17 for all types of equipment to which this section applies; and in Figure C-18 for rubber-tired self-propelled scrapers; Figure C-19 for rubber-tired front-end loaders, rubber-tired dozers, and motor graders; and Figure C-20 for crawler tractors and crawler-type loaders.

(b) Table V-1 contains a listing of the required apparatus for all types of equipment described in subsection (2)(a) of this section.

TABLE V-1

Means to measure	Accuracy
Deflection of ROPS, inches	$\pm 5\%$ of deflection measured.
Vehicle weight, pounds	$\pm 5\%$ of the weight measured.
Force applied to frame, pounds . .	$\pm 5\%$ of force measured.
Dimensions of critical zone,	± 0.5 in. inches.

(5) Vehicle condition. The ROPS to be tested must be attached to the vehicle structure in the same manner as it will be attached during vehicle use. A totally assembled vehicle is not required. However, the vehicle structure and frame which support the ROPS must represent the actual vehicle installation. All normally detachable windows, panels, or nonstructural fittings shall be removed so that they do not contribute to the strength of the ROPS.

(6) Test procedure. The test procedure shall include the following, in the sequence indicated:

(a) Energy absorbing capabilities of ROPS shall be verified when loaded laterally by incrementally applying a distributed load to the longitudinal outside top member of the ROPS, as shown in Figure C-17, C-18 or C-19 as applicable. The distributed load must be applied so as to result in approximately uniform deflection of the ROPS. The load increments should correspond with approximately 0.5 in. ROPS deflection increment in the direction of the load application, measured at the ROPS top edge. Should the operator's seat be offcenter, the load shall be applied on the offcenter side. For each applied load increment, the total load (lb.) versus corresponding deflection (in.) shall be plotted, and the area under the load-deflection curve shall be calculated. This area is equal to the energy (in.-lb.) absorbed by the ROPS. For a typical load-deflection curve and calculation method, see Figure C-21.

Incremental loading shall be continued until the ROPS has absorbed the amount of energy and the minimum applied load specified under subsection (7) of this section has been reached or surpassed.

(b) To cover the possibility of the vehicle coming to rest on its top, the support capability shall be verified by apply-

ing a distributed vertical load to the top of the ROPS so as to result in approximately uniform deflection (see Figure C-17). The load magnitude is specified in subsection (6)(b)(iii) of this section.

(c) The low temperature impact strength of the material used in the ROPS shall be verified by suitable material tests or material certification (see subsection (7)(b)(iv) of this section).

(7) Performance requirements.

(a) General performance requirements.

(i) No repairs or straightening of any member shall be carried out between each prescribed test.

(ii) During each test, no part of the ROPS shall enter the critical zone as detailed in SAE J397 (1969). Deformation of the ROPS shall not allow the plane of the ground to enter this zone.

(b) Specific performance requirements.

(i) The energy requirement for purposes of meeting the requirements of subsection (6)(a) of this section is to be determined by referring to the plot of the energy versus weight of vehicle (see Figure C-22 for rubber-tired self-propelled scrapers; Figure C-23 for rubber-tired front-end loaders and rubber-tired dozers; Figure C-24 for crawler tractors and crawler-type loaders; and Figure C-25 for motor graders. For purposes of this section force and weight are measured as pounds (lb.); energy (U) is measured as inch-pounds).

(ii) The applied load must attain at least a value which is determined by multiplying the vehicle weight by the corresponding factor shown in Figure C-26 for rubber-tired self-propelled scrapers; in Figure C-27 for rubber-tired front-end loaders and rubber-tired dozers; in Figure C-28 for crawler tractors and crawler-type loaders; and in Figure C-29 for motor graders.

(iii) The load magnitude for purposes of compliance with subsection (6)(b) of this section is equal to the vehicle weight. The test of load magnitude shall only be made after the requirements of subdivision (b)(i) of this subsection are met.

(iv) Material used in the ROPS must have the capability of performing at zero degrees Fahrenheit, or exhibit Charpy V notch impact strength of 8 foot-pounds at minus 20° Fahrenheit. This is a standard Charpy specimen as described in American Society of Testing and Materials A 370, Methods and Definitions for Mechanical Testing of Steel Products. The purpose of this requirement is to reduce the tendency of brittle fracture associated with dynamic loading, low temperature operation, and stress raisers which cannot be entirely avoided on welded structures.

(8) Source of standard. This standard is derived from, and restates, the following Society of Automotive Engineers Recommended Practices: SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers; SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front-End Loaders and Rubber-Tired Dozers; SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders; and SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders. These recommended practices shall be resorted to in the event that questions of interpretation arise. The recommended practices

appear in the 1971 SAE Handbook, which may be examined in each of the department of labor and industries regional offices.

[Statutory Authority: Chapter 49.17 RCW. 95-10-045, § 296-306-26001, filed 5/1/95, effective 1/16/96; 93-07-012 (Order 92-24), § 296-306-26001, filed 3/5/93, effective 6/1/93; Order 76-28, § 296-306-26001, filed 9/28/76.]

Reviser's note: Exhibit B, Figures V-1 through V-28, is codified as WAC 296-306-27095.

Chapter 296-401 WAC CERTIFICATION OF COMPETENCY FOR JOURNEYMAN ELECTRICIANS

WAC

296-401-175 Journeyman, specialty and trainee certificate, and examination fees.

WAC 296-401-175 Journeyman, specialty and trainee certificate, and examination fees.

- | | |
|---|-------|
| (1) Journeyman or specialty electrician certificate renewal (per 36-month period) - | \$ 60 |
| (2) Late renewal of journeyman or specialty electrician certificate (per 36-month period) - | \$120 |
| (3) Journeyman or specialty electrician examination application (nonrefundable) - | \$ 25 |
| (4) Journeyman or specialty electrician original certificate [(submitted with application)] - | \$ 40 |
| (5) Trainee certificate (expires one year after purchase) - | \$ 20 |
| (6) Trainee certificate renewal or update of hours - | \$ 20 |
| (7) Journeyman or specialty electrician test or retest fee - | \$ 45 |

[Statutory Authority: Chapter 19.28 RCW (RCW 19.28.060, [19.28].550, [19.28].600). 95-15-034, § 296-401-175, filed 7/12/95, effective 8/14/95. Statutory Authority: RCW 19.28.060, 19.28.010(1), 19.28.600, 19.28.510(2), 19.28.540(2) and 19.28.550. 92-09-010, § 296-401-175, filed 4/2/92, effective 5/3/92. Statutory Authority: RCW 19.28.060, 19.28.600, 19.28.510(2), 19.28.540(2) and 19.28.550. 90-17-041, § 296-401-175, filed 8/10/90, effective 9/10/90. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-175, filed 8/29/86. Statutory Authority: RCW 19.28.060 and 19.28.210. 85-20-065 (Order 85-16), § 296-401-175, filed 9/27/85. Statutory Authority: RCW 19.28.120 and 19.28.510. 83-23-053 (Order 83-32), § 296-401-175, filed 11/14/83.]

Reviser's note: RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

Title 308 WAC LICENSING, DEPARTMENT OF (Formerly: Motor Vehicles, Dept. of and Licenses, Dept. of)

Chapters

- 308-12 Architects.
- 308-13 Board of registration for landscape architects.
- 308-56A Certificates of title—Motor vehicles, etc.
- 308-88 Rental car taxation and licensing.
- 308-91 Reciprocity and proration.
- 308-93 Vessel registration and certificates of title.
- 308-94 Snowmobiles and off-road and nonhighway vehicles.
- 308-96A Vehicle licenses.
- 308-124 Real estate brokers and salesmen.
- 308-124A Real estate—Licensing and examination.
- 308-124H Real estate course school and instructor approval—Education of real estate brokers and salespersons.
- 308-125 Real estate appraisers.
- 308-330 Washington model traffic ordinance.

Chapter 308-12 WAC ARCHITECTS

WAC

- 308-12-025 Application for examination.
- 308-12-083 Repealed.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 308-12-083 Identification of registrant. [Statutory Authority: RCW 18.08.420 and 18.08.310. 87-19-095 (Order PM 676), § 308-12-083, filed 9/17/87.] Repealed by 95-04-080, filed 1/31/95, effective 3/3/95. Statutory Authority: RCW 18.08.340.

WAC 308-12-025 Application for examination. (1)

The application for examination must be submitted on forms approved by the board, accompanied by academic and/or practical experience verification to document eligibility under the provisions of RCW 18.08.350. Applications for admission to a scheduled examination must be submitted or postmarked not later than the following dates:

Examination Months/Divisions	Cut-off Dates
June - All Divisions	April 1
December - B(Graphic), C	October 1

(2) On subsequent attempts examinees may retake any divisions offered not passed on previous attempts. Applications for examination or reexamination must be accompanied by the application fee for examination or reexamination fee and the appropriate examination fee for each division as established by the director and published in chapter 308-12 WAC, architect fees. For reexamination applicants, examination fees are listed by separate division.